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Table of Contents.

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ORIGINAL ARTICLES— Page.

The Management of Inoperable Malignant Disease in General Practice, by THOMAS HAMILTON .. 817
Radiation Methods in Cancer of the Lower Bowel, by R. A. GARDNER 829
Crohn's Disease, by J. C. Bell Allen, M.B., Ch.M., F.R.C.S. 831

REPORTS OF CASES—

Severe Tetanus with Recovery, by R. L. THOROLD GRANT, M.B., M.R.C.P., F.R.A.C.P. 833

REVIEWS—

Biochemistry for Medical Students 834

LEADING ARTICLES—

The Psychological Treatment of Crime 835

CURRENT COMMENT—

Injuries to the Eye Resulting from Childbirth .. 837
A Dental Thesis 837
"M and B 693" in Malaria 838
The Vegetative Nervous System in Acrodynia .. 838
National Health Insurance 839

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—

Surgery 840

BRITISH MEDICAL ASSOCIATION NEWS— Page.

Scientific 842

MEDICAL PRACTICE—

Addiction to Morphine and Heroin 846

CORRESPONDENCE—

Indian Fire-Walking 848
The First Use of Radium Needles in Australia .. 849
Transposition of the Viscera 849

THE ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS—

Examination for Membership 849

OBITUARY—

John Binny Hay 850

BOOKS RECEIVED 850

NOMINATIONS AND ELECTIONS 850

DIARY FOR THE MONTH 850

MEDICAL APPOINTMENTS VACANT, ETC. 850

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 850

EDITORIAL NOTICES 850

THE MANAGEMENT OF INOPERABLE MALIGNANT DISEASE IN GENERAL PRACTICE.

By THOMAS HAMILTON,
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Be Serious. Be Observant. Be Silent.
Sympathise with Suffering.
Respect the Art that Heals and Saves.

This precept, emblazoned on the white-tiled wall of the old Alfred Roberts operating theatre at the Royal Prince Alfred Hospital, Sydney, captured my eye and my imagination simultaneously when I first entered the students' gallery some twenty years ago. Its vivid impression has remained with me ever since.

"Sympathise with Suffering"—a noble and a high ideal; like a flaming beacon it points the straight path to the practitioner who is faced with the management of inoperable malignant disease. It answers for him in a strong affirmative the question, "Is it worth while?" Its inspiring text has brought comfort to many unfortunate victims of advanced cancer and has brightened the way of many a practitioner who has undertaken the task of their treatment, often for little or no material remuneration.

The careful management of inoperable malignant disease is worth while if for no other reason than that of common humanity. It is worth while because long contact with its sufferers will prove an ennobling experience for the medical attendant and will give him a closer insight into the souls of his fellow men than is attainable under any

other circumstances. When advanced malignant disease is mentioned, one's mind automatically flashes back through the ghosts of the practice, ghosts of former patients facing an impending doom, some grimly, some cheerfully, nearly all courageously, albeit a few in a state of anxiety almost amounting to craven terror.

From the patient's viewpoint it is worth while because there is no other alternative except a surrender to the inevitable. Despite the hopeless prognosis, there is no reason why his physical and mental comfort should not receive consideration, and he should at least have the consolation of knowing that his doctor has explored every avenue which might give him even a slender way of escape. No patient with cancer is ever too ill or has cancer too advanced for some form of physical or psychological therapy.

The Practitioner's Duty.

Before a case of malignant disease can be classed as inoperable it is the plain duty of the medical attendant to prove to the complete satisfaction of his conscience that no known therapeutic or surgical attack would be of any avail. This duty may involve a survey not only of the cancer problem in the district in which he practises, but also a survey of all the therapeutic and diagnostic aids which exist therein that might be of any help to the patient.

In my own practice, which is located in the city of Newcastle, New South Wales, a busy seaport and industrial town of 120,000 inhabitants, the bulk of the cancer work is centred in the Newcastle General Hospital, which has a well-equipped radium clinic and complete operating theatre and laboratory facilities. The laboratory is in charge of a competent full-time pathologist, but the hospital does not as yet possess an apparatus for the application of deep X ray therapy. Patients requiring deep X ray treatment have therefore to be sent to one of the big metropolitan hospitals in Sydney, the capital city, which lies 100 miles to the south of Newcastle. The General Hospital serves not only for the population of Newcastle, but as a base hospital for the whole of the Hunter River district, which embraces many small outlying agricultural and coal-mining towns with a combined total population of 219,000. A good nursing service exists, but is not run on an organized district or charitable basis. An excellent ambulance transport service is available.

The incidence of cancer in the Newcastle and Hunter River district, in common with the rest of the civilized world, appears to be on the increase. A perusal of the Government statistician's figures reveals that 209 deaths resulted directly from malignant disease in 1936, and in 1937 there were 236 deaths (*vide* Table I). In the main municipal area of my practice, Newcastle, with a population of 13,950, there were 17 deaths in 1936 and 20 deaths in 1937, although my own cancer cases were not exclusively confined to the one municipality.

TABLE I.

Cancer Deaths in Newcastle and Hunter River Combined Sanitary District, 1936–1937.[1]

District.	Population, 1937.	Cancer Deaths, 1936.	Cancer Deaths, 1937.
Adamstown	5,120	5	2
Carrington	3,160	5	9
Cessnock	14,510	15	11
Hamilton	20,110	18	31
Lambton	4,610	4	7
Maitland East	4,360	5	6
Maitland West	8,250	20	8
Merewether	8,960	5	7
Morpeth	1,040	—	1
Newcastle	13,950	17	20
New Lambton	6,830	6	7
Singleton	3,810	4	5
Stockton	5,740	2	5
Waratah	21,690	20	20
Wickham	12,210	6	15
Wallsend	7,330	13	8
Shires—			
Bolwarra	3,660	5	5
Kearsley	27,850	22	23
Lake Macquarie ..	31,250	25	35
Port Stephens	5,250	5	5
Tarro	9,980	7	6
Totals	219,610	209	236

[1] Made available by the courtesy of Dr. J. R. Shannon, Health Officer, Newcastle, New South Wales.

In Australia as a whole, since statistics were first recorded in 1879, the cancer death rate has gradually risen. It must not be overlooked, of course, that this may be due in part to the fact that many more cases are being diagnosed with increasing accuracy and at an earlier stage. In 1936 cancer was the direct cause of death in 7,551 cases, averaging one in every 8·5 deaths. These figures would be alarming for a population of six and a half million people in a young country were it not for the fact that many more patients are being saved at an earlier stage. Figures presented at the annual cancer conference at Canberra established the hopeful fact that 70% of patients in the early stages were apparently cured, while 2% died. Surgery, radium and X rays are being used as the main curative methods.

The purpose of this paper, however, is to deal with the cases in which the patients have come for operation too late—verily a lost legion. It is the duty of the general practitioner to do what he can for these unfortunate people. He should be able to plan the resources of his district in such a way that its full therapeutic, hospital and nursing facilities can be made available for his patients if need be.

In my practice management of a typical inoperable case is undertaken according to the following well-defined plan.

1. An examination and survey of the patient are made in detail.

A careful case history is taken, special attention being paid to the duration of symptoms, loss in weight and the time of appearance of any tumours. Home surroundings, the family background and economic factors are included.

A careful clinical examination is made.

The diagnosis is definitely established, and for this purpose, if necessary, I consult with my

surgical colleagues and use modern diagnostic facilities, such as X rays and biological estimations, and take a biopsy specimen if practicable.

The patient is submitted to exploratory surgery if the general practitioner cannot establish to his own satisfaction that the condition is inoperable. Case I, to be described later on, illustrates how surgical exploration resulted in an X ray diagnosis of inoperable carcinoma being disproved. In this respect, even if a patient's condition is considered inoperable, the removal of a fungating mass of cancer tissue will often give the patient a few extra months of comparative comfort; and also partial removal of a growth by surgery may be of assistance as a prelude to a later attack by radium or deep X ray therapy. Cases VIII and IX, described in a later section, illustrate this.

When the condition has been judged surgically inoperable, other modes of attack should be considered if the patient and his relatives will consent. Radium or deep X ray therapy may be well worth while, if not from a curative then from a palliative viewpoint.

If all therapeutic methods of attack on the disease fail, then the patient's comfort and symptomatic ailments must be attended to. This includes provision for suitable nursing and the relief of pain, besides attention to the mental distress which sometimes greatly affects both the patient and his relatives.

2. Prognosis must be considered.

3. Treatment and the guidance of the patient through subsequent psychological and economic ills must be undertaken.

Details of Management.

It may be instructive for me to consider this scheme of management in greater detail, having regard to the various types of cancer and quoting further illustrative cases from my practice.

Although the practice includes seven hundred and fifty lodge patients, it has been noticed during the past ten years that patients of all types are gradually taking heed of the educational propaganda regarding cancer issued from time to time by the Commonwealth Government, and many are presenting themselves for examination on the appearance of any unusual lump or swelling.

On the other hand, when a patient has no outward or visible signs of malignant disease, but perhaps has the equally serious signs of loss of weight and failing strength, he is much more casual in his attitude towards a medical examination; and it is not until his failing condition is well manifest to his friends that they become alarmed and beg him to seek medical advice. During this period he may have let several valuable months slip by and have taken refuge in patent nostrums. It is a strange fact that Australians lead the world per head of population in the taking of patent medicines. This phase of the patient's illness should be thoroughly investigated in the history taken by his medical attendant, and, although voluminous case-taking is not common amongst general practitioners, it is always wise to investigate previous illnesses and any family history pointing to an hereditary tendency towards cancer.

In the general examination of the patient an inoperable malignant condition may often be suspected at the first examination, and one must then use the other aids to diagnosis mentioned above in order to confirm the opinion formed. The following case is an example of one in which this routine was employed.

Mrs. G., aged seventy-two years, was first seen in November, 1937. She stated that she had been ill for two and a half months, complaining of increasing weakness and generalized aches and a definite occasional pain of moderate severity in the right side of the abdomen. She stated that she had on four occasions seen bright blood in the urine, and this was not accompanied by scalding or frequency of micturition.

Examination in November revealed an old, thin, pale woman with a moderate degree of anæmia. A large mass was palpable in the right hypochondrium, about the size of a large orange and extending well out into the flank. A catheter specimen of the urine revealed numerous red blood cells and the presence of hyaline and granular casts.

A tentative diagnosis of a tumour of the right kidney was made, and she was referred to a consultant at the General Hospital for further examination. This further examination, made on December 6, 1937, consisted of the making of a blood count, which confirmed the diagnosis of secondary anæmia; also a retrograde pyelogram revealed a large well-marked tumour of the right kidney, apparently of the Grawitz type. The skiagrams of her chest and long bones revealed no metastases. As she was a "poor operative risk" in view of her age and general condition, the dangers attached to an operation were pointed out to the patient and her friends. She decided against the operation and subsequently went away to stay with relatives in the country. Her medical attendant there, to whom the clinical notes were forwarded, informed me by letter that she later developed ascites and massive œdema of both legs. She died on March 1, 1938.

When the general practitioner has decided that he cannot reasonably class the condition as inoperable until surgery has been attempted, several considerations must be given careful thought. The problems of this nature are most commonly associated with malignant disease of the abdominal viscera.

Thus in cases of advanced abdominal carcinomata, which are reasonably obvious when first seen by the general practitioner, it is often a moot point whether the patient should be subject to a diagnostic laparotomy. Metastases in other organs, such as the lungs, will contraindicate the procedure. In many cases the patient himself will make the decision, but it is his medical attendant's duty to point out to him the risks involved and the gravity of the prognosis. Very often death follows the additional strain imposed by an operation, the chief complications being shock, sepsis and weakness. The following case is illustrative of this.

W.N., aged fifty-nine years, hairdresser by occupation, was seen on October 10, 1933. He stated that for the previous six weeks he had been troubled with increasingly severe constipation, which finally had been relieved only by the use of enemata. Over the same period he had also suffered intermittent, colicky, abdominal pain, spasms of which were often severe. This also was relieved to some

extent by the enemata. His appetite had been very poor and his loss in weight over the previous three months had been 16·0 kilograms (two and a half stone). His present weight was 54·0 kilograms (eight stone six pounds). In the previous three weeks he had developed a cough at night-time, with expectoration of thick sputum. During the previous week he had noticed that his stools had been very small and narrow in shape.

On examination he was found to be a thin, emaciated, elderly man. His tongue was coated but moist, the abdomen moved evenly with respiration, and there was no definite tenderness or rigidity. A hard mass was palpable in the epigastric region to the left of the mid-line, and dulness was noticeable in both flanks. On October 11, 1933, under anæsthesia, a sigmoidoscope could not be passed further than 16·0 centimetres into the bowel, and no signs of newgrowth were visible; but the lump in his epigastrium was felt to be large and irregular, and other small nodules were palpable in the vicinity. Apart from indications of a chronic bronchitis, an X ray examination of the lungs revealed no abnormality. His response to the Wassermann test was negative. The facts of the case were pointed out to the patient and his relatives, and it was their wish that an exploratory examination of the abdomen should be undertaken.

On October 18, 1933, through a supraumbilical paramedian incision the abdominal cavity was opened. A hard mass growing from the greater curvature of the stomach was found situated between the stomach and transverse colon with much matting of the omentum. The omentum throughout was studded with small hard nodules. The preaortic and lumbar glands were enlarged and very hard, as also were those in the hepatic fissure. Small white secondary deposits were found on the inferior aspect of the liver. In the abdominal cavity there was a moderate amount of blood-stained fluid. A nodule was removed from the omentum for pathological examination.

The case was obviously one of inoperable carcinoma, and this was confirmed by the pathological examination of the excised nodule, the pathologist's report being as follows:

Macroscopically the specimen consists of fatty tissue with a small area of whitish tissue in the centre. This cuts easily and on section has a yellowish colour. Microscopically the tissue shows the structure of mesenteric fat infiltrated with a highly cellular newgrowth, apparently originating in glandular tissue and showing early colloid changes.

The patient was in a greatly weakened condition following the operation, and his death took place five days later. The only consolation to the surgeon and the relatives was the knowledge that he had been spared a lingering death from cachexia.

In contrast with the foregoing straightforward course, diagnoses of carcinoma in patients referred by the general practitioner to a consulting surgeon (and this sometimes when the diagnosis seems very obvious) are occasionally disproved either at operation or at *post mortem* examination, to the chagrin of both practitioner and surgeon.

The following case is not unusual. It is illustrative of two which have occurred in my practice.

M.W., a farmer, was first seen in May, 1937. He was heavily jaundiced, had lost 12·8 kilograms (two stone) in weight in the previous four months and his abdomen was distended. Fluid, presumed to be ascitic in origin, was detected in both flanks, his liver was grossly enlarged, and his general appearance was such that one was prompted to make a very definite diagnosis of carcinoma of the head of the pancreas. He was referred for a confirmatory opinion to the General Hospital, and the honorary surgeon decided on an exploratory laparotomy. This was carried out, the surgeon reporting that the pancreas was greatly enlarged in size and stony hard, and that the surrounding tissues, including the stomach and omentum, were involved in the general spread of the growth and were densely adherent to it. The surgeon agreed with the provisional diagnosis. The patient died eighteen days after the laparotomy, and a *post mortem* investigation was made.

The pathologist reported that the mass on section had revealed a chronic pancreatitis with no signs of carcinoma, and that the sections of the liver had presented the typical appearance usually found in association with chronic pancreatitis. There were no signs of cancer in any of the sections, so that the case, while representing all the clinical features of inoperable malignant disease of the pancreas, was apparently one of a long-standing chronic pancreatitis.

Had no laparotomy been done the patient would undoubtedly have been classed as a victim of cancer.

This further illustrates the importance of securing a section of tissue from the affected organ when a laparotomy is made, so that the macroscopic evidence can be confirmed by the microscope.

Malignant disease offers many more peculiar problems to the general practitioner when it is proved inoperable and the patient has survived the necessary surgical exploration (*vide* Case IV among the case histories described later). Probably the patient will be discharged from hospital when the operating surgeon has decided that eradication of the growth is impossible. The situation on the return of the patient to his home is often as follows.

1. The relatives have been informed of the true facts of the case at the hospital, and the medical attendant has also made it his business to receive information of the operative findings.

2. The patient has not been told of the findings, either because of the disinclination of the surgeon to give him a hopeless prognosis, or at the expressed desire of the relatives.

3. The patient returns to his own medical adviser feeling better after his enforced stay in bed and the careful dieting, and is mentally expectant of a cure, although uneasy in his own mind that his recovery from the operation has not been greeted with more enthusiasm by his relatives.

In brief, his mental outlook is one of a hopefulness in which the wish for recovery is father to the thought, and yet subconsciously he has, if he is at all well educated, the fear that all is not as it should be with his physical well-being. Such situations require extremely tactful handling by the general practitioner, and he should keep in close touch with the relatives and assure himself of the patient's mental outlook. He must realize that the patient is faced with a period of possibly as long as eighteen months during which he will become progressively weaker and his capacity for the intake of nourishment will become progressively less. Gradually the poor victim will become impatient with his delayed recovery and will ask his medical adviser for a frank explanation. At this stage the doctor would be well advised to tell him the facts calmly and frankly, tempering his explanation to the intellect of the patient and keeping his remarks

on the philosophical rather than on the pathological aspects. If this explanation has been well timed and diplomatically executed, the patient, who will at this stage have been subconsciously prepared for it, will be extremely grateful to his doctor and may possibly develop a quiet philosophic outlook towards his impending death. The relatives also will be relieved, and the worry and strain of awaiting the death of the patient will be lessened for all concerned. In the meantime the doctor can do a great deal for his patient by encouraging him to take a cheerful outlook, to enjoy his remaining days as far as possible, and so to meet his end courageously. Therapeutically he can also assist the patient by the timely administration of symptomatic treatment, and, if a district nurse is available, by instructing her to minister to the patient and so keep him bodily comfortable.

However, the course of the family doctor is not always so smooth. Wealthy patients, particularly those of a low order of intellect, together with their relatives, may not feel disposed to accept the verdict as final. The power of money is brought in, fresh consultants are demanded, and newspapers and pseudo-scientific magazines are scanned for news of any sensational developments in the search for cancer cures.

Here the family practitioner would be well advised to acquiesce in their demands as far as is compatible with his self-respect, knowing that in the end his judgement, which has left nothing to chance, will be proved correct (*vide* Case II, described later). He should ask the relatives to nominate an eminent consultant of their own choice and bring the latter into touch with the patient after providing him with full details of the clinical and laboratory investigations. In nine cases out of ten the relatives will accept this final opinion. Sometimes they will not inform the doctor of their desire for a fresh opinion, but will obtain one secretly. Here again, after a repetition of examinations and investigations, the harassed patient will find himself back where he started and will be forced to admit sorrowfully to his own doctor that he has gained nothing by refusing to accept his opinion in the first place. Others will visit herbalists and unqualified "quacks", such as chiropractors, with sorry results to their dignity and their cheque-books, and in the end they too will realize that their only safe sheet-anchor rests in the stability and sincerity of their family doctor.

This does not mean that other avenues of attack on malignant disease which has been proved inoperable should not be carefully considered by the practitioner. Radium is a powerful weapon, which must not be despised, and if there is a slight chance of mitigating the patient's suffering or of prolonging his life even by a short number of months, it would be wise to seek the aid of a competent radiotherapist. Radium, however, can be a two-edged sword, Recently, a senior colleague, whom I knew very well, found that he was suffering from a malignant type of cancer of the floor of the mouth. Rather than submit to a mutilating operation he elected to have it treated by the insertion of radium needles. These were inserted and a massive dosage was given. He suffered great pain, developed cellulitis followed by sepsis in the soft tissues of the neck, and died within ten days of the insertion of the radium.

Case III, described later, illustrates the fact that sometimes deep X ray therapy, while retarding the spread of malignant tissue, can give the patient such severe reactions that life becomes intolerable.

Recently, Furnivall (1938) and others have in *The British Medical Journal* drawn attention to similar cases. I am of the considered opinion that, with judicious use in suitable cases, radium and X ray therapy can be of great value in helping the patient. Treatment gives the patient a psychological uplift, because it is felt that something is being done, and it may offer him a few extra months of life, a factor which may be of tremendous importance to many a victim, even from an economic viewpoint alone.

Surgical diathermy has its uses in the treatment of fungating masses of cancerous tissue on the body surface. Often the removal of an offensive area by the endothermic knife will leave the patient with a reasonably clean granulating surface, which is much preferable to an ulcerating slough with its accompanying malodour.

Chemical hæmotherapy, such as the introduction of selenium, is not used to any extent in Australia, and I have had no cases in my practice.

Cancer even in advanced stages has been known to disappear spontaneously; but this occurrence is quite exceptional and should not be taken into account in the prognosis. It does no harm to mention the phenomenon to a patient who is in the throes of dejection and needs a mental stimulus.

Prognosis.

Accuracy in the prognosis of disease is generally accepted by the layman as evidence of professional experience and knowledge. When the condition is inoperable, any information which can be given as to the expectation of life, the nature of the symptoms which probably will mark the course of the disease, and what can be expected from the treatment of these symptoms is most gratefully received. In those cases of inoperable growths in which some palliative procedure can be carried out, the family should be informed of the facts on which the opinion is based. In fact, the practitioner will probably find that it is wise to keep the family more fully informed of the facts of the prognosis than the patient, because in the majority of cases relatives have an insatiable curiosity regarding morbid processes in their own kith and kin. They expect the doctor to answer such questions as: "How long will he last?" "Will he suffer much pain?" "Will his memory go?" "Will he become unconscious or die in agony?". Every general practitioner of any experience is no doubt fully conversant with the frequency of these and innumerable other questions. He should endeavour to answer them all

as competently as he can, but at the same time should avoid restricting himself to too narrow limits in prognosis. It is impossible for anyone to forecast the exact duration of life when malignant disease is involved, and if by chance a doctor forecasts with success to within a week or even a month he will probably be hailed as a wizard. So many factors enter into the estimation, such as the general resistance of the patient to the disease process and his resistance to intercurrent infections, that it is extremely hard to say just how long life can continue.

Many inoperable malignant growths are of the slow-growing type, in which a duration of life up to eighteen months or two years is possible from the time of diagnosis (Case IV, described later). The size and bulk of a tumour are not necessarily a guide to its malignancy. The smallest tumour may offer the worst prognosis (Case V, described later), particularly in growths of the mouth, stomach and breast.

Intercurrent complications which are liable to cause death in malignant disease, apart from complications due to metastases, are pneumonia, pulmonary emboli, anæmia and heart failure, in conjunction with exhaustion. I do not remember ever having seen in Australia a case of advanced cancer with tuberculosis.

In estimating the probable survival of the patient, therefore, it would be wise for the practitioner to base his primary opinion on the average of a large number of cases, such as are published from time to time in medical text-books ("Medical Annuals", 1933-1934), and to vary his opinion according to the symptomatology as the case progresses. It is important also in any estimate of survival to take into account the age and general stamina of the patient, and if possible also to form an opinion as to the relative grade of malignancy of the growth; in fact many American authorities, notably Broders (1925) and his colleagues (1931), claim that grading of the malignancy stands first in importance in the prognosis. The extension of the lesion is also of great significance when taken in conjunction with its anatomical situation, and in this respect survival in cases of brain tumour is exceedingly hard to estimate with any accuracy. Extension by metastases spread in the blood stream may also cause death much more rapidly than if the spread had been in the lymphatic circulation. Brown and Warren (1938) recently illustrated this most interesting feature in a complete series of 170 rectal carcinomata.

Treatment.

It is at the treatment stage in the management of inoperable malignant disease more than any other than the physician is called on to "sympathise with suffering and respect the art that heals and saves". He knows that no method of therapy will save the life of the patient, and his problem is to ease pain and prolong life. A thousand and one things can contribute to the patient's comfort and peace of mind. First among them I would place the personality of the doctor—a friendly approach, an attitude that inspires confidence, a genuine interest and a sympathetic understanding. With a little tact, a little gentleness and a modicum of patience the most distressing interviews can be carried through without great hurt. If in this way he can give the patient a glimpse, even though only a fleeting one, of his more human side, he has accomplished a great deal.

It is axiomatic that pleasant surroundings are conducive to contentment, and it is with a view to obtaining these for the patient that the medical attendant must utilize the knowledge obtained in his preliminary survey of the district. Individual patients may each have a different economic problem: an aged couple may find their security threatened by an illness of one of them; a mother may deny herself care out of concern for the welfare of her children; a bread-winner may be in a ferment of mental anxiety because his wages have been discontinued during his illness. These are all problems in management which are brought acutely to the notice of the family doctor. Money can solve many of them, and in the well-equipped district a social service worker may be available to undertake the burdens of those who have no money. All, however, will require the guidance and advice of the practitioner. In a district which is not well equipped with community and social aids, all the natural resources within the patient's own group of relatives and friends may be mobilized. If this seems inadequate, one can then turn to the community for aid. I have not hesitated in my own practice to seek the assistance of clergymen, medical officers of health, the local Rotary Club and other associations whose work is concerned with community service. In a case of inoperable breast cancer last year the lady members of the hospital auxiliary provided a fully trained nurse to call in each day and minister to the patient during the last two months of her life. It was a pleasure to visit the home after the arrival of the nurse and find the patient clean and comfortable and her room tidily arranged, where previously she had been lying helpless and quite unattended except for the pathetic efforts of a daughter aged fourteen years.

Each patient presents a different physical problem in treatment, and, according to the anatomical situation of the cancer, some will have a more difficult time than others. Details of the various therapeutic measures are fully outlined in text-books, such as the various indices and dictionaries of treatment, but there are several from my own experience which are worth mentioning from a practical aspect.

The practitioner, even when busy, should arrange to visit the patient at least once or twice a week. Careful directions should be given regarding the patient's daily programme, and he should be allowed as much activity, especially in the open air, as can be tolerated without fatigue. Sunlight is invigorating and helpful.

The normal nutrition of the patient must be maintained when possible, a suitable diet being prescribed in detail to meet the needs of the individual case. For example, the diet of a man with a newgrowth of the œsophagus will be very different from that of a woman with an inoperable cancer of the breast. Diets with a rich protein and vitamin content will often improve the health of the patient and may even produce a considerable gain in strength. In cases of carcinoma of the œsophagus, such as outlined in Case II, a liquid diet may be required as the diameter of the œsophagus gradually becomes restricted. The liquids should be rich in proteins and vitamins given in the form of fresh eggs, milk, fruit juices and various nutritious extracts, such as finely ground whole liver suitably flavoured. This form of nourishment, frequently administered at regular intervals, will often restore the patient to a comparatively comfortable state. Where the gullet is irritable, the substitution of rectal feeding for a few days will often permit spasm, pain and irritation to subside, when liquid food by the mouth may be again resumed. When the obstruction becomes so complete as to prevent the entrance of even liquid food to the stomach it is worth while recommending the patient to a consultant skilled in the introduction of Souttar's tubes. A well-fitting tube gently introduced through the stricture will often add many weeks to the patient's life, and, in addition to preventing an early death from starvation, it gives him a great deal of comfort. Upon failure to insert the tube the operation of gastrostomy offers the only alternative to slow starvation. If this operation is practicable, it should be performed before the strength of the patient has become undermined. In the case of the patient quoted above, offers of aid by the introduction of a Souttar's tube and, alternatively, by a gastrostomy operation were rejected. The patient was fearful of any procedure savouring of a surgical operation.

Anæmia in patients with malignant disease is a frequent occurrence, especially as an aftermath of extensive X radiation, and often can be lessened by appropriate treatment. It is important to incorporate along with a suitable diet large doses of iron in the form of *Ferri et Ammonii Citras*. The administration of whole liver will be found effective in certain cases and may prove useful in decreasing anæmia due to chronic blood loss. It is also a useful adjuvant in the treatment of X ray sickness (Case III). The anæmia of sepsis is best fought by an attempt to overcome, if possible, the source of infection, and here the drainage and dressing of any ulcerated or sloughing areas, such as occur in fungating carcinoma of the breast, should be given careful attention.

Stimulants may be prescribed according to the needs of the individual case, and, in view of the inevitable certainty of the prognosis, a good-humoured and reasonable latitude may be allowed patients who have been accustomed to intoxicants.

At present I have a patient, dying with carcinoma of the rectum, who for many years has had a fondness for good sherry. He is now consuming one bottle of sherry a day, and occasionally, during temporary periods of despondency, takes a childish delight in forgetting his troubles with the aid of an extra bottle, which renders him comfortably mellow and contented. I suspect that there is also a modicum of devilment in his excess, as he seems to derive a great deal of pleasure from shocking his worried relatives with his bibulous sayings. His psychology is that of the "eat, drink and be merry" variety.

From my own experience I am not convinced that gastro-enterostomy in advanced cancer of the stomach is worth while as an aid in prolonging life, and I now would recommend it only when the gastric conditions, as revealed by X rays, are peculiarly adapted to the operation. In Case IV (described later) the patient did not have a gastro-enterostomy and lived fairly comfortably for eighteen months after his laparotomy.

Pain is a symptom which always calls for relief, and here I am of the opinion that in general practice there is nothing to better the ordinary tincture of opium; it can be prescribed in gradually increasing doses as the patient becomes tolerant to the drug. In the earlier stages it is perhaps better to use small doses of aspirin and later a combination of codein and aspirin, and to reserve opium for the later stages. Morphine is best avoided, if possible, until all other drugs have ceased to be effective. It is surprising how often, with judicious care, it is possible to do away with the use of hypodermic injections of opiates. I find that they have a bad psychological effect, not only on the patient but on his relatives, if used before they are absolutely necessary.

Uræmia should be watched for in cancer of the genito-urinary tract, although more often than not in such cases complications arise from metastases in other organs rather than from destruction in the tract itself.

In malignant disease of the lungs postural drainage is often helpful and other proper medical procedures may be applied to control cough and expectoration, while at the same time sustaining the strength of the heart.

In cancers of the breast (*vide* Case V) one of the most trying complications is œdema of the arm, which seems to occur in about 10% of advanced cases. The arm becomes considerably swollen, and at first the œdema is soft and pits on pressure; soon it becomes solid and the arm may increase to a large size. The skin becomes tense and shiny, and there is a gradual diminution in muscular power until paralysis ensues. Then the practitioner may consider recommending treatment by high voltage X rays with a view to the relief of the pain and the bringing about of a reduction in the size of the arm; but such strenuous treatment is not advisable if the patient can be made reasonably comfortable by simpler means. Gentle massage of the arm from the wrist to the insertion of the deltoid muscle will often relieve minor degrees of œdema; and the use of pressure bandages, applied

while the arm is held above the head and suspended in this position for several hours, tends to diminish swelling. Suspension of the arm alone may prove beneficial. Owing to the pain which sometimes occurs, the administration of hypnotics may be necessary; but in the case quoted in my own series, although the arm is considerably enlarged and paralysed, pain is conspicuous by its absence and the patient's only complaint is of gradually increasing weakness.

In carcinoma of the head of the pancreas (Cases VI and VII), when the common bile duct is gradually occluded, great misery is often caused to the patient by the intolerable itching of the jaundiced skin.

One patient gained great relief by the taking of saline baths and the wearing of pure silk pyjamas. At night during the warm weather he gained most comfort from sleeping on a leather-covered lounge chair with his feet propped up on cushions and an electric fan revolving gently near by. Another, in poorer circumstances, relied on cool fresh bed sheets and frequent applications of calamine lotion. Hypnotics were necessary at times to aid them, and the bromides proved particularly useful.

It was of interest to note that as each patient became more deeply jaundiced the degree of skin irritation lessened.

Last Stages.

"Men fear Death as children fear to go in the dark; and as that natural fear in children is increased with tales, so is the other."

Those words of Francis Bacon are just as true today as they were when written in 1612. It is strange that any gloom surrounding a patient dying of incurable cancer generally emanates from the relatives rather than from the patient. The ostentatious relative with the mournful face, the stage-whispering voice and tip-toeing footstep should be tactfully banned from all contact with the sick-room.

Many patients are cheerful to the last.

One old gentleman's sole ambition was to reach his eighty-first birthday. This he did and was so delighted that he gave a small party for his friends. He was greatly amused when one of his guests, in an absent-minded moment of heartiness, wished him many happy returns. Two days later he died quietly in his sleep. I had visited him two hours previously and he did not seem physically or mentally distressed, although heavily jaundiced, but talked brightly on several general topics.

Religion is a mental solace to many, and here the parish priest or visiting clergyman may prove a powerful ally to the medical attendant, who, when practicable, should invite his close cooperation in ministering to the patient.

Strange requests are sometimes made to the visiting practitioner. They may range from invitations to witness a last will and testament to a frank request for euthanasia. To the latter he must offer an uncompromising refusal, for euthanasia has no place in the civil code of the Empire or in the Hippocratic oath, which says, *inter alia*: "I will give no deadly medicine to anyone if asked, nor suggest any such counsel."

To requests such as the former he must base his decision upon judgement and common sense, reflecting beforehand on any legal possibilities which may eventuate at a later date.

"Comfort the dying" should be his text throughout the last days of his patient's life and, as mentioned previously, a serene calmness, a tactful understanding and a sense of human compassion will earn the sincere gratitude of both patient and friends alike. In so doing, the physician's reward is the knowledge that he has truly fulfilled the sacred obligations of his craft.

Case Histories.

Case I.

S.A., aged fifty-nine years, an iron worker by occupation, was first seen on August 4, 1936. He stated that for the past three months he had been troubled with discomfort in the epigastrium, coming on two hours after each meal. This discomfort was partially relieved by vomiting and partially by the taking of alkalis. He had not suffered from any actual pain, and his symptoms were steadily getting worse; he thought he had lost weight, although he was not sure how much.

On examination he was a tall, pale man, inclined to stoop, and looked wasted and older than his years. In the abdomen there was a suspicion of a mass palpable near the mid-line and just under the left costal margin.

The barium meal and X ray examination of the stomach revealed a mass at the cardiac end of the stomach, which was irregular in shape and appeared to be about the size of a small orange. It was about 4·44 centimetres in diameter, and the radiologist was of the opinion that the mass was malignant in character.

The patient was referred to a surgeon at the General Hospital and his abdomen was opened. The mass was found to be a large chronic and indurated ulcer on the upper third of the posterior surface of the lesser curvature of the stomach. The surgeon was of the opinion that it was non-malignant, as it was movable within a short range and there was no evidence of any spread along the stomach wall or to the adjoining mesenteric glands. Nothing further was done, the abdomen was closed and the patient was returned to the ward for medical treatment.

After three weeks' treatment with an approved gastric ulcer dietary regime his condition improved considerably, his weight increased and he felt very much better. In addition he was given five cubic centimetres of a 5% solution of histidine intramuscularly every day. He was discharged from hospital on the twenty-fourth day after admission and returned to work nine weeks after his operation, feeling perfectly well. The barium meal and X ray examination just prior to his return to work revealed that the ulcer mass had completely cleared up and the radiologist reported the stomach as being apparently normal.

This case illustrates the advisability of an exploratory laparotomy in order to confirm or disprove the X ray diagnosis of abdominal malignant disease.

Case II.

J.M., aged sixty-seven years, had been an occasional patient for seven years. In 1934 he had had a successful removal of the prostate gland, and in the centre of the excised prostate the pathologist reported the finding of a small primary adenocarcinoma.

In March, 1936, he complained of regurgitation of food and symptoms which he described as "indigestion". He had also lost almost a stone in weight.

On examination his weight was 20·85 kilograms (139 pounds) and a lump was thought to be palpable in the epigastrium. He was referred to a radiologist (Dr. A.

Sullivan), who reported that there was a large filling defect at the lower end of the œsophagus and the cardiac end of the stomach. The radiologist expressed the opinion that the lesion was an inoperable newgrowth. In view of the fact that he had a history of acquired syphilis thirty years previously and was reluctant to have an exploratory operation he was given intensive treatment with mercurials and iodides. This treatment was not maintained longer than three weeks, as the results of his Wassermann and flocculation tests were negative, and it was known that he had been soundly treated by antispecific measures prior to the excision of his prostate. The tumour of the stomach and his symptoms were not influenced in any way by the treatment, and his weight loss became progressively worse. He was then advised frankly that his condition was of the utmost seriousness and that delay in the confirmation of the X ray diagnosis was dangerous, although this had been intimated to him at the commencement of his illness. Influenced by his wife, he refused to submit to any operative procedure whatsoever, and assumed a fatalistic attitude, even refusing to have a Souttar's tube inserted into the œsophagus in order to relieve his difficult deglutition.

Between April and October he progressively lost 9·0 kilograms (twenty pounds) in weight. He then came to me with a clipping from a popular paper extolling the value of "Ensol" in the treatment of advanced cancer, and insisted on trying it. I accordingly made inquiries regarding "Ensol" and, finding that it was a research solution announced by Dr. H. C. Connell in Canada in 1935, I referred him to Dr. Neville Davis, the only practitioner in Sydney who had studied Connell's technique. The patient was treated with "Ensol" while confined to bed in hospital, and afterwards at his home until April, 1937. Dr. N. Davis subsequently gave a published report of the case from his viewpoint to *The General Practitioner of Australia* (May 15, 1937). The patient and his friends had been so interested in the "Ensol" injections, for which great claims were made, that they had held aloof from any consultations with their family doctor during the period of treatment. In fact they were inclined to blame him for not having thought of "Ensol" sooner.

Late in April I was called to see the patient again, and found that he was so weak and undernourished that it was necessary to admit him to a private hospital for appropriate treatment. After a further barium meal and X ray examination on May 1, 1937, Dr. Sullivan reported as follows:

> Three hours after taking the opaque meal the stomach was empty, except for small irregular masses of barium in the cardiac end. These have the appearance of being around fungating masses. Further opaque meal showed that the œsophagus is dilated about two inches above the cardiac orifice. Below this it is irregular, but the opaque material is not appreciably delayed. The œsophagus is improved in appearance since previous examination. I was unable to fill the cardiac end of the stomach. The film, taken with patient lying prone, shows that the cardiac end is very irregular and does not fill. The non-filling must be due to a mass filling the lumen or to fibrosis, but probably the former. I did not observe any peristalsis and suggest that there is carcinomatous infiltration of its walls. The organ is smaller than previously. In my opinion the present state is worse than at time of previous examination.

Even the patient himself had now lost faith in "Ensol", although he claimed that he had felt better while having it. He became progressively weaker and died on July 9, 1937, one year and four months from the time that he first was diagnosed as having an inoperable cancer; his death resulted from slow starvation and gradually increasing weakness. He retained his full mental faculties until three days before his death, when he lapsed into a semi-coma. No *post mortem* examination was permitted. He was an extremely hard patient to manage, on account of his fatalistic attitude and the dominance of his wife.

Case III.

Mrs. M.K., aged fifty-four years, was first seen on June 22, 1937. She stated that she had first noticed a lump in her left breast fifteen months previously. It was then about the size of a small plum and was not painful. Since then it had grown gradually until it was about twice its original size, and had been intermittently painful during the last five months. She had borne five children and had no recent loss of weight. A gynæcological section had been done six years earlier for "womb trouble", but she was not sure of the exact nature of the trouble.

On examination there was a tumour palpable in the left breast at the junction of the upper and lower lateral quadrants. It was about six centimetres in diameter, round and hard. It did not appear to be attached to the skin or to the deep structures of the chest. There were no palpable regional glands.

One week later she was admitted to the General Hospital, and on June 30, 1937, the honorary surgeon performed a wide simple amputation of the breast, evidently feeling that the tumour might prove non-malignant. He informed me after the operation that the mass was about the size of a small orange and appeared to be completely encapsuled. He thought that if it were malignant it might prove to be of a low grade of malignancy which had not broken out in a general spread to the remaining breast tissue.

The pathologist reported that the histological structure of the tumour was that of adenocarcinoma of the encephaloid type, and that it appeared to be confined to the centre of the tumour mass.

The patient made a good recovery and was discharged from hospital two weeks after her operation.

When she returned home I deemed it advisable, in view of the pathological findings, and also because a radical amputation had not been done, to refer her for a course of deep X ray therapy in Sydney. The following letters, from the staff of the radium clinic at the Royal Prince Alfred Hospital, reveal the subsequent course of the patient while undergoing this treatment.

> Royal Prince Alfred Hospital,
> 3rd August, 1937.
>
> Your patient Mrs. M.K., reported to this department today and I have prescribed for her a complete course of deep X ray therapy to the left breast and its entire glandular drainage area.
>
> There was no evidence of enlarged glands or recurrences on examination.
>
> At the conclusion of the treatment she will be referred back to you for reexamination.
>
> Yours faithfully,
> (Signed) E. W. FRECKER,
> Hon. Asst. Radiotherapeutist.

> Royal Prince Alfred Hospital,
> 2nd November, 1937.
>
> Reporting *re* Mrs. M.K., who had a post-operative course of deep X ray therapy treatment after partial excision for *carcinoma mammæ*.
>
> This patient completed treatment here on the 3/9/37 and returned for examination again today, and I now find that she has several small hard nodules lying in the scar. In view of the previous pathological report (encephaloid carcinoma) these are most certainly metastases. I have therefore prescribed for her some further treatment to the affected area, which she will receive in about three weeks' time.
>
> Yours faithfully,
> (Signed) E. W. FRECKER,
> Hon. Asst. Radiotherapeutist.

> Royal Prince Alfred Hospital,
> 10th March, 1938.
>
> Reporting *re* Mrs. M.K.
>
> The two small nodules previously palpable have almost completely resolved. The presumption is that they were metastatic in nature, established in view of the pathological report.

I think she should have an X ray examination of her chest done, but as she wishes to return home at once it is impossible to have it done here.

In any case I would like her to report to this department in one month's time, although if you are satisfied that the lesion is clear she might extend it to two months.

Yours faithfully,

(Signed) E. W. FRECKER,
Hon. Asst. Radiotherapeutist.

The patient returned to her home in Newcastle on March 11, 1938, and was suffering such a severe reaction from the extensive course of X ray therapy that it was necessary to readmit her to the Newcastle Hospital for symptomatic treatment. She was in great pain and the skin overlying the left side of the thorax, axilla and left flank was extensively "tanned" by the X rays. She complained of great difficulty in breathing comfortably, and stated that she had a feeling as if she were perpetually "sea-sick". While in hospital she was given injections of liver extract and general nursing care. As suggested by the radiotherapist, an X ray examination of her chest was also made, but no metastases were revealed. She has now returned to her home and, while feeling much better, is still suffering from the dehydration and fibrosis of the tissues which followed the huge dosage of X ray therapy.

Psychologically, while glad of the assurance that she is now reasonably free from cancer, she has a very marked dislike for the deep X ray machine, and I doubt if she would submit to any further administrations from it, even if further metastatic cancer appeared.

Case IV.

A.A., a carpenter, fifty-six years of age, was brought by his wife for an examination on August 13, 1934, very much against his will. He was inclined to make light of his symptoms, but finally it was ascertained that he had suffered from "indigestion" for twenty years. During the previous three months the discomfort in his stomach had taken the form of pain immediately after meals. He noticed that the eating of fruit intensified his pain, but the taking of alkaline powders gave him relief. He thought he had lost 12·8 kilograms (two stone) in weight. He was habitually constipated.

Examination showed him to be a thin, prematurely aged man, whose weight was 54·85 kilograms (eight stone eight pounds). A firm rounded tumour was palpable in the left epigastric region of his abdomen, just below the left costal margin.

An X ray examination of the stomach was made one week later, the radiologist reporting as follows.

> The stomach is normal in size and position. The distal half of the stomach appeared to be definitely smaller than normal. I was unable to detect any peristalsis. When it was filled with barium one definitely received the impression of a filling defect of the distal third of the stomach. This filling defect appeared to be uniform. The outline of the greater curvature in this region was irregular.
>
> The duodenal bulb is normal. The duodenum is normally outlined. The head of the meal was in the caecum in five hours.
>
> The evidence would suggest *carcinoma ventriculi*.

The Wassermann test elicited no reaction.

He was referred to the General Hospital and an exploratory operation was carried out on August 29, 1934. At operation a large hard mass along the lesser curvature of the stomach was found and the growth seemed to be infiltrating the whole of the stomach wall, producing the condition known as "leather bottle stomach". Two small metastatic nodules were noticed on the under-surface of the liver and several nodules were present in the lesser omentum. One of these was excised for pathological examination and the wound was closed. The pathological examination revealed the diagnosis as adenocarcinoma.

The patient returned to his home three weeks later, not having been told of the result of the pathological examination; but his relatives were fully informed of the facts and were advised to let him resume his normal life as far as possible.

Feeling better as a result of his stay in hospital, he resumed his occupation and managed to carry on for three months. He then became so weak, owing to persistent loss of weight, that he was obliged to give it up and become a semi-invalid at home. His wife called me in to attend him again and, owing to the failing confidence of the patient in my ability to cure him, it was found necessary to indicate to him that his condition was serious, although even at this stage he was not told that his condition was hopeless. The explanation appeared to reestablish his confidence, and he passed the next three months living as an invalid quietly at home. He then felt well enough to go away for a holiday in the hope that his health might improve, and I did not see him for a further six months. I was then told by a colleague that he had been consulted by the patient, who had led him to believe that his operation had been undertaken for a chronic gastric ulcer. The patient had consulted him secretly, thinking that he was not progressing sufficiently well in health. When the patient returned to his home, after having undergone a further series of gastric tests and X ray examinations, he was very much worse. He had lost further weight and his diet had been reduced to liquids, as his stomach was unable to retain any bulky food whatsoever. He commenced to have difficulty in swallowing successfully, and the tumour mass in his abdomen was very prominent, his liver having become greatly enlarged and hard. By careful management, on the lines already indicated, he survived a further five months and finally died in February, 1936.

Prior to his death he literally presented the clinical picture of a "living skeleton". His skin was yellowish-brown and tightly drawn over the bony prominences, and his strength was negligible. He managed to avoid intercurrent infections and his death was due to the profound asthenia induced by the growth and its metastases.

Case V.

Mrs. S., aged fifty-three years, entered my consulting room on November 17, 1936, and showed me a small firm lump in her left armpit. It was no larger than a small bean, attached to the skin, and apparently had its origin in one of the superficial axillary sweat glands. Her breasts were small, and careful palpation revealed no evidence of any lumps or any enlarged glands. There were no sores or lesions on the hand or arm which would be likely to produce an axillary lymphadenitis. I frankly did not think that it was a malignant condition, but she was requested to return in one week for further observation. She failed to do this and did not attend until May 20, 1937. The lump was now hard and fixed to the deeper tissues of the axilla. It had commenced to fungate through the skin in the form of a brownish-black nodule. No evidence of a primary growth was detected in the breast, but it was realized that the condition was serious and she was immediately advised to seek the services of a surgeon.

On June 8, at the General Hospital, the surgeon dissected the axilla and found that total removal of the growth was impossible, as the deeper portions were wrapped closely round the main axillary vessels and even invaded the deep lymph glands of the supraclavicular area. He removed as much of the tissue as possible and submitted it for pathological examination. The pathologist reported as follows.

> The surface epithelium shows no proliferation or downgrowth. It ceases abruptly at an area where densely packed masses of cells arranged in columns are present. In the deeper parts there is a stroma of dense fibrous tissue and many glandular structures having the appearance of sweat glands. These are very irregular in size and shape, and show proliferation of the lining epithelial cells, some of which contain a brownish-yellow pigment. The tissue is definitely malignant; whether of the nature of a non-pigmented melanoma, which some features suggest, or adenocarcinoma originating in sweat glands it is difficult to say.

The patient was discharged from hospital two weeks later, with the wound soundly healed, and was referred to the cancer clinic at the Royal Prince Alfred Hospital in Sydney. There she was given treatment with deep X rays and returned home one month later with a firm scar in the armpit and the surrounding skin showing evidence of the application of the rays. She reported at the clinic at monthly intervals and, in spite of further extensive radiation, cancer nodules commenced to appear in the skin and superficial tissues of the left breast.

After her final treatment in April, 1938, her left arm became œdematous and the tissues of the left side of the chest were in the state known as *cancer en cuirasse*. During the first week in May she returned to her home feeling very exhausted after her treatment. The limb was so swollen that it became paralysed and useless. She stated that she had no pain, but her only complaint was of great weakness and difficulty in breathing. Her left lung was practically immobile and seemed to be in a state of interstitial fibrosis, a condition which had probably been brought about by the deep X ray treatment rather than by metastases, which were now very evident throughout the skin of the thorax. Her left breast was enlarged to twice the size of the right breast.

At home she was patient and uncomplaining of her condition and was assiduously nursed by the members of her family. Her mentality was quite clear, but she had no appetite and her weakness gradually increased until she finally died quietly on June 30, 1938.

The case illustrates how a small nodule may be the forerunner of a very serious and malignant growth. The seriousness of the patient's failure to return for observation after being warned in the early stages of the disease is obvious. The general reaction to extensive deep X ray treatment was pronounced and left her very short-winded. Possibly I should have been more alert at her first visit to my surgery and insisted on a biopsy of the small lump.

Case VI.

T.R., aged eighty years, a retired jeweller, returned from a tour of England and the test matches in October, 1934. He called on me on October 21, 1934, and, having previously known him well, I was shocked at his appearance. He was wizened and appeared to have lost weight, his skin and conjunctivæ had a bright icteric tinge, and he was obviously a man in ill health.

He told me that while in England he had noticed his skin and eyeballs commencing to turn yellow and he had experienced a certain amount of gastric discomfort, finding that certain varieties of food, particularly fats, upset him. Apart from this he had felt no pain, but had noticed that his urine had been brownish-yellow in colour.

He produced a series of X ray films of the gastric and biliary tracts, accompanied by a letter to me from a surgeon in Oakland, California. The letter informed me that the patient had been examined prior to his embarking for Australia, and the writer was of the opinion that the diagnosis was one of inoperable carcinoma of the pancreas. His Wassermann test elicited no reaction.

The patient, who was a man of keen intellect and cheery disposition, demanded that I tell him the whole facts of his diagnosis. After having a surgeon colleague review the clinical evidence with me, I did so. The patient thanked me and said whimsically: "I suppose I can again look forward to resuming my travels around the world in another sphere."

His courage and cheerfulness were amazing, and, as mentioned elsewhere, his sole ambition was to pass his eighty-first birthday; this ambition was achieved and he died suddenly, three weeks later, on February 11, 1935, five and a half months after the diagnosis of his carcinoma had been made. Prior to his death his common bile duct must have been almost completely occluded, for his urine was heavily laden with bile, his skin was bronzed with the yellowish-brown pigment of jaundice, and he suffered from great itching on this account. His mentality was clear to the last, and two hours prior to his death he was conversing cheerfully with me on various general topics. Pain in his case was conspicuous by its absence, and his skin irritation was relieved to some extent by the administration of bromides and "Luminal". Morphine was not necessary at any time.

Case VII.

J.B., aged forty-eight years, a gas manufacturer by occupation, was first seen on June 15, 1936, and stated that he was suffering from gastric discomfort and felt that he was losing his strength. His gastric discomfort came on at irregular intervals and was mainly on the right side of his abdomen, with an aching pain referred to the back, between his shoulder blades.

On examination he was mildly jaundiced and his eyeballs had an icteric tinge. No definite tumour was palpable in the abdomen and he was not sure of his exact loss of weight.

He was advised to have an X ray examination of the gall-bladder, but would not discontinue his work and worked on for a further five weeks at his occupation. Five weeks later his jaundice was more pronounced, he complained that his urine was dark in colour and he was suffering from an itchiness of the skin; he had also lost another stone in weight. A further examination revealed that his liver was enlarged and extended to five centimetres below the right costal margin, and the skiagram, which had been taken in the meantime, showed that his gall-bladder was not functioning.

FIGURE I.
Showing specimen in Case VII. *A*: distended gall-bladder; *B*: distended common bile duct; *C*: pancreas; *D*: carcinoma (partly cut away); *E*: right hepatic artery and attached portion of liver. (Specimen and photograph by courtesy of Newcastle Hospital.)

On July 22, 1936, he was admitted to the General Hospital with a diagnosis of "obstructed common bile duct, probably due to carcinoma of the head of the pancreas". In hospital further tests were done, including an examination of the fæces, which revealed a total fat content of 18%, a fatty acid content of 9·3%, neutral fats 3·7%, and soap fats 4·8%. The Wassermann and Kline tests elicited no reactions.

An examination of the blood revealed a red cell count of 3,940,000 per cubic millimetre, with a colour index of 0·84, the coagulation time being seventeen minutes and the bleeding time three and a half minutes. In view of the lengthy coagulation time the honorary surgeon decided that an exploratory operation would be fraught with too much risk of hæmorrhage and, owing to the reasonable certainty of the condition being due to a malignant growth, it was considered that nothing further could be done for the patient, except by good nursing care and attention. He returned to his home and was carefully nursed by his wife and daughter under my directions, but finally they were unable to carry on successfully and, through the courtesy of the medical superintendent of the hospital, he was readmitted.

The main difficulty in the management of the patient in his own home was to ease the intolerable itching which he experienced in his skin; bromides and "Luminal" proved useful, but on several occasions it was necessary to give him morphine. The application of calamine lotion to the skin and a supply of cool linen sheets in his bedding helped to alleviate his misery. Pain over the site of the growth was conspicuous by its absence.

In hospital he went steadily down hill and died on August 22, 1936, two months after his admission and within four months of first noticing his symptoms.

The nursing notes from the hospital show that in the week prior to his death he had several persistent attacks of epistaxis. These were controlled by packing of the nostrils with gauze soaked in adrenaline and by the injection of 10 cubic centimetres of calcium gluconate given intravenously. He also bled on several occasions from two large hæmorrhoids.

A *post mortem* examination revealed that the diagnosis of carcinoma of the head of the pancreas was correct, and when the specimen was excised *in toto* it consisted of a large hard growth totally enclosing the common bile duct, with a grossly distended gall-bladder and a greatly enlarged liver. (See Figure I.)

Case VIII.

Mrs. B., aged fifty-eight years, came from the country in January, 1935. She stated that she had been troubled with a lump in the right breast for the previous seven years, and in the past eighteen months the lump had suddenly grown bigger. Six months previously it broke through the skin of the breast.

On examination she presented the worst picture of a fungating carcinoma of the right breast which I have ever seen outside a medical school. The mass was 6·0 centimetres wide and 12·0 centimetres long. It was dark brown in colour and the surface was dry and hard. It was not offensive, but several patches of softening were apparent near the centre of the growth. When asked why she had not come along for examination at an earlier date she stated that she feared she might be placed in hospital for an operation. I strongly advised her to enter the General Hospital and at least have the fungating mass removed. This she decided to do and was admitted to the General Hospital one week later.

The surgeon removed the fungating mass from the breast as widely as he could, and was able to bring the skin flaps over the denuded area of the chest wall, with the exception of a portion about 5·0 centimetres square. This area subsequently became covered with healthy granulation tissue and the patient returned to her home feeling much the better for the removal of the mass, which had been seriously disturbing her physical and mental comfort.

Six weeks after her return home she commenced to experience pain and slight œdema in the right arm. She was accordingly referred to Sydney for deep X ray treatment, and after a course of four weeks' treatment returned to her home. Owing to the hopeless nature of the condition the radiotherapist had been content with moderate doses of X rays and the patient was not inconvenienced by the treatment. Subsequently her arm became very œdematous and swollen, but she suffered no pain.

Arrangements were made for a district nurse to attend her as she gradually became helpless, and she died six months after her return from Sydney. During that time she was very cheerful and seemed to appreciate greatly the attention of both her nurse and doctor.

I am convinced that in this case great comfort was derived by the patient from the surgical treatment and later from the deep X ray treatment, although her condition was so far advanced that a cure was out of the question.

Case IX.

Mrs. I., aged forty-nine years, was first seen on January 11, 1938. She complained of a lump in the right breast, which to her knowledge had been there for only the past three weeks. It had been painful in the mornings on waking and was tender when pressed.

On examination she was a woman with very large pendulous breasts; there was an indurated mass about the size of a golf ball in the upper and inner quadrant of the right breast. It was hard and tender on palpation. Palpable and tender glands were present in the right axilla. One week later she was admitted to the General Hospital for a radical amputation of the right breast, a diagnosis of scirrhous carcinoma having been made.

The surgeon set out to do a radical removal of the breast, but found that the deep axillary and pectoral glands were penetrating and involving the intercostal muscles of the chest wall in the spread of the growth. He accordingly did not proceed further, knowing that it would be useless unless the whole of the growth could be resected, but contented himself with removing as much of the growth as was possible without unnecessarily mutilating the patient. The depth of the growth was a surprising outcome, which was unsuspected prior to operation. The pathologist reported on the excised section as follows.

1. Lymphatic glands. The lymphoid tissue is replaced by masses of growth with structure of adenocarcinoma, apparently originating in adenocarcinoma of the breast or possibly axillary sweat glands.
2. Breast tissue is very hard, and sections are not yet to hand.

On recovery from the operation the patient returned to her home with her wound soundly healed, and two weeks later was referred to the radium clinic at the Royal Prince Alfred Hospital, Sydney. It was hoped that deep X ray therapy might arrest the progress of the disease and that the patient had a slight chance of making a full recovery.

Dr. H. J. Ham, the honorary radiotherapist, was evidently of the same opinion, because he wrote me after seeing the patient and said: "I agree with you that an extensive course of deep X ray therapy is indicated, and I am arranging for this to be carried out as early as possible." The course was commenced on March 11, 1938, and continued for six weeks at regular intervals. The patient then returned to her home and is feeling much better, although suffering a little from the large dosage of X rays. So far there are no signs of metastases and the patient is under the impression that her treatment may result in a permanent cure.

As her medical adviser I am not so optimistic, but feel that a good deal has been done in the way of attack on an otherwise inoperable growth.

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RADIATION METHODS IN CANCER OF THE LOWER BOWEL.[1]

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THE history of the radiation treatment of bowel carcinomata, with the one exception of anal epitheliomata, does not show any outstanding successes such as have been gained with tumours in other sites. So it is that, with the exception named, radical operative removal, where this is possible, is in general the only sound course to advise in bowel cancer.

Where operation for various reasons is not possible, palliative radiotherapy may be advised. There is very little in common, except situation in neighbouring parts of the alimentary tract, between cancer of the recto-sigmoidal area, cancer of the ampulla and cancer of the ano-rectal region. The glandular drainage and cellular pathology all vary, and cancer of the ano-rectal region is cytologically a skin cancer.

In cancer of the lower bowel we deal with various cytological types. Some of these are radio-resistant and some radio-sensitive. In the anal region we have a squamous cell carcinoma. More proximally we find an adenomatous type, generally highly differentiated, sometimes, though rarely, anaplastic. Whilst an anaplastic type is, of course, more radio-sensitive, it is also more active in producing metastasis. Hence, treatment of the primary tumour may come at too late a stage to save life. Further, in early malignant disease of the rectum, as Cuthbert Dukes has pointed out, we are often dealing with a rectum in which potential malignant disease is present in other sites, and he has shown how hyperplasia, adenoma and carcinoma are closely linked.

Biopsy is of great value in making available as much knowledge as possible of the cytological nature of the growth. Leddy (1937) stresses the importance of microscopic grading of the tumour.

In a recent case an apparent failure was instructive on the value of the information to be given by biopsy and on the difficulty of clinical differentiation of early recurrence from other conditions.

Mrs. D., previously operated on for piles in another city, was referred to me for radium treatment by Dr. Coppleson, of Sydney. A biopsy had been performed, which showed the growth to be very undifferentiated, some of the cells showing an alveolar arrangement, but apparently arising from squamous cell carcinoma. A temporary colostomy had been performed by the referring surgeon, and the tumour-bearing region was irradiated to 6,000 *r* over eight days. The enlarged superficial inguinal glands were removed, but on section were normal. Three months later the anal canal was normal. One month later again a small ulcer developed; excision was decided upon, and microscopic examination revealed superficial necrosis and changes due to irradiation. Six months after irradiation the patient was reported well, with sphincter control.

In general, successful radiotherapy of a primary tumour can be no better than successful ablation, except in one respect: that is, that the amount of healthy tissue destroyed may be less when radiation is employed. Therefore, when it is possible to conserve sphincter control, or where, as rarely happens more proximally, the growth is radiosensitive, irradiation may be the method of choice. But when biopsy shows the growth to be radioresistant, and when operative removal is still possible, this is obviously the method of choice.

In operable cases the question is whether a routine colostomy and the hopeless abandonment of the patient are sound procedure, or whether it is not better to perform a colostomy (or an anastomosis if practicable) and then to give the patient the benefit of palliative treatment.

The patient may be unfit for operation, either by reason of the extent of the growth or by reason of his general condition, or because of coexisting disease, or because of refusal to submit to operation. The question of irradiation should always be considered in such cases, and the radiotherapist should be in possession of the fullest information available as regards the extent and the nature of the growth. He should then decide whether cure is to be aimed at or palliation only sought for. It must be emphasized that in the majority of cases there is no question of irradiation's competing with surgical removal.

The greatest benefit to the patient can be achieved only as a result of the fullest cooperation between the pathologist, the surgeon and the radiologist, and this demands sound teamwork. For example, a growth in the rectum can, on the one hand, sometimes be made operable by the use of irradiation. On the other hand, an operation of access (for example by removal of the coccyx and the lower segment of the sacrum) can make possible more adequate irradiation.

Methods of Irradiation.

Radium.

1. *Squamous Cell Epithelioma of the Anus.*—The two main methods of irradiation in squamous cell epithelioma of the anus are (*a*) the Fondation Curie (Paris) method and (*b*) the Manchester method.

The Fondation Curie method is as follows: After a preliminary colostomy needles are placed around the anus in a direction parallel to its axis and of such length as to extend beyond the growth. The dose is 0·3 to 0·6 millicurie destroyed per centimetre measured along the anal axis. The time taken is eight days. Additional beam therapy is given from

[1] Read at the Australian Cancer Conference, Wellington, New Zealand, on February 15, 1939.

a two-gramme unit at a distance of eight centimetres, the total dose being 300 millicuries destroyed over three weeks.

In women the dosage is supplemented by a vaginal applicator. Applicators are not placed in the anal canal.

By the Manchester method a volume is irradiated which includes the whole growth and is conveniently a cylinder. Six to eight needles are placed around the periphery of the cylinder. The needles are made longer than the growth to compensate for the falling off in dosage at the upper end of the cylinder. A needle of the same length, packed around with soft rubber, is placed in the anal canal and the skin end of the cylinder is irradiated from a surface applicator. The dosage is adjusted according to the Paterson-Parker rules, and 5,000 to 6,000 *r* should result in the disappearance of the growth. Colostomy may be obviated, the anal applicator being removed when necessary.

Sometimes in a radiosensitive growth, where for any reason other methods cannot be used, treatment on the following lines may be attempted. After a line source of radium surrounded with as much packing as the stenosed canal will allow has been introduced, and a dose of 2,000 *r* has been given to the mucous membrane, it will be found after one week that the lumen is much wider. The procedure is then repeated with increased packing. The diameter of the lumen as expanded by the packing is measured and the number of milligramme-hours or millicuries destroyed, necessary to produce 2,000 *r* can be calculated. This may be done from Sievert's (1921) original analysis of the distribution round a line source together with Mayneord's (1932) or other figures for the *r* value at one centimetre's distance from one milligramme of radium. It can also be taken from the Paterson-Parker curves.

2. *Carcinoma of the Rectum and Colon.*—Two main methods of treatment by gamma radiation have been used in the treatment of carcinoma of the rectum and colon; these are the implantation of seeds into the growth, and the application of tubes of radium or radon through a proctoscope or sigmoidoscope.

Bowing and Fricke (1934) describe the technique used in the Mayo Clinic, namely gold radon seed implants in association with coagulation of the tumour, and also by contact treatment with radium tubes in the lumen. They give 40 to 100 milligramme-hours per square centimetre, treating portions daily until the whole lesion has been covered. In the case of an annular growth, an area equal to the length of field is treated daily, 300 to 700 milligramme-hours per application.

X Rays.

Levitt (1935) has expressed the view that in some cases in which the enlarged glands decrease in size to a greater extent that the primary tumour, this is due to the better dosage; but Regaud (1935) holds the view that adequate dosage is usually possible but requires to be of so high a level as to damage normal structures of similar radiosensitivity.

Niedermahr reported two cases in 1937: in one a five field technique was used to treat a recurrence after a radical operation; eight years later the patient was symptom free. In a second case, in which the lesion was irradiated, having been found inoperable, a radical removal was later possible, the patient being well seven years later.

Chaoul (1937) reports nine cases; two patients were well over a period of two years, one was well over one year, and four were symptom free after a period of less than one year. These patients were treated by his method after removal of the bony wall.

It would be interesting to apply radium after similar access had been provided.

The British Empire Cancer Campaign Report for 1938 mentions two patients out of four recently treated at St. Bartholomew's Hospital, who remain symptom free. On the other hand Leucutia (1938), who used 500 kilovolts, reported only three out of 28 patients so treated who were still living. This series included, however, patients with lesions in other parts of the alimentary tract.

There is a striking correspondence between the results claimed by Chaoul's methods and those obtained by 700 kilovolts treatment, notwithstanding that twelve times the kilovoltage was employed in the latter case as in the former. Probably the sole common factor was adequate heavy and limited dosage absorbed by the cancerous tissues.

Some methods described are clearly inadequate. Hare (1937) in a paper condemning radiotherapy as useless, even for palliation, records thirteen unsuccessful cases and reports as typical a case in which 1,200 *r* in divided doses was given unsuccessfully to a recurrent nodule three centimetres in diameter situated at the base of a perineal scar. Many people would regard 1,200 *r* as unlikely to influence a malignant adenoma.

E. A. Merritt (1937) quotes a case in which four-year palliation of a growth in the sigmoid was obtained by X rays. He describes another case in which the growth became operable as a result of treatment, the patient remaining well for three years.

These cases date back to 1924. He reported, in 1937, thirty-seven cases; fourteen patients were still living. The treatment he uses is a combined X and gamma radiation. He uses four ports, each of approximately 200 square centimetres, and gives 3,000 *r* to each, over 60 days. A distance of 50 centimetres is used, with a heavy Thoraeus filter at 220 kilovolts peak; hence the depth dose, though not stated, would appear fairly high. This is supplemented by dosage from a radium pack inserted in the rectum. A total dose of three to four gramme-hours is administered at the rate of four to six hundred milligramme-hours per day.

Laccassagne (1931), reporting forty-nine cases of rectal cancer in Paris from 1919 to 1929, found no cure directly attributable to radiotherapy.

Somewhat better, but still very depressing, were the figures reported in 1935 by Sir Charles Gordon Watson; only six out of one hundred and forty patients were well four and a half years or more after treatment by radium alone.

From the Marie Curie Hospital it was reported, in 1938, that five out of twenty-five patients treated by radium up to December, 1932, were still living.

From Saint Bartholomew's Hospital it was reported, in 1938, that eight out of ninety-two patients were still living, seven years or more after treatment. Thus over the years some improvement may be discerned.

Bacon (1937) reviewed five hundred cases of cancer of the anus, rectum and colon, the subjects having come to necropsy after biopsy. He was appalled to note that in the vast majority of cases radical surgery or palliative colostomy had been performed, but irradiation had not subsequently been employed; yet on autopsy recurrence and metastasis were observed.

Higher tumour dosage produced in the smallest volume capable of including the tumour is, in my view, desirable when treatment of cancer of the rectum or colon by X rays is attempted. This can best be accomplished when the depth dose curve has a steep gradient, as for example Chaoul's method, or when multiple small cross firing beams are used, or by Dessauer's method as du Mesnil de Rochemont has shown. Tumour dosage of adenocarcinoma possibly as high as 8,000 *r* over three weeks is desirable, though not commonly practicable.

Whether this can be achieved more economically and efficiently by low voltage (Chaoul) or high voltage (1,000 kilovolts) or by refinement of our present methods with the more usual 200 kilovolts technique, remains to be seen.

Conclusion.

Irradiation has cured bowel cancer; less rarely it has rendered inoperable growths fit for operation; that it will do so more frequently in the future and allow beneficial palliation more regularly is, I think, to be expected as the increased precision of our methods allows greater aggressiveness in our attack.

To sum up, the method of choice in anal epitheliomata and possibly in anaplastic operable tumours is radiotherapy. For all other bowel cancers operative removal is the method of choice where this is still possible. When the lesion is inoperable, palliative radiation on present-day lines is strongly to be advised.

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CROHN'S DISEASE.

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REGIONAL ILEITIS, or Crohn's disease, has only recently been recognized as a separate entity, and most of the writing on this subject has come from America, although of late articles have appeared in English journals (Jackman,[1] James,[2] Barbour and Stokes,[3] Mailer,[4] Hodgson,[5] Ralphs,[6] Barrington-Ward and Norrish[7]). Only one case appears to have been recorded in Australia (Keith Ross[8]). Two patients suffering from this disease have recently been under my care. Their cases are recorded below.

Case 1.

D.C., a male, aged fifteen years, a messenger boy, was seen on October 7, 1938. He complained of abdominal pain situated in the umbilical area, of three to four weeks' duration. He had not vomited, but he had had some diarrhœa. He stated that he was losing weight.

On examination the boy looked ill, was pale, and had a tender area in the right iliac fossa. No mass could be palpated in this situation, but some muscle guarding was present. His heart and chest were normal, and his urine contained no abnormal constituents.

A diagnosis of appendicitis was made and the patient was admitted to hospital.

At operation on October 10, 1938, the abdomen was opened through a gridiron incision. Free straw-coloured fluid was present in the abdomen. The appendix appeared to be normal and obviously was not the cause of his symptoms. This fact led to further exploration, which revealed an appearance typical of Crohn's disease, involving the lower eighteen inches of the ileum. This area was very thickened and œdematous, and felt hard on palpation. It was congested and of a bright reddish colour; lymphatic nodulation and enlarged hard mesenteric glands were present. The involved area of ileum was sharply demarcated at the ileo-caecal valve, with a less definite upper border. The ascending colon over a distance of six inches was somewhat thickened, but to a considerably less degree, and was not so congested. The appendix was removed and the abdomen closed without drainage.

On the second day after operation the temperature rose to 39·5° C. (103° F.) and subsided by lysis, becoming normal seven days later. It was not again elevated during the patient's stay in hospital, which lasted until October 28.

A blood count was made on October 12, 1938, and the following results were obtained. The erythrocytes numbered 4,750,000 per cubic millimetre of blood, the hæmoglobin value was 70%, and the colour index was 0·74. The leucocytes numbered 17,400 per cubic millimetre; 75% were neutrophile cells, 6% were monocytes, and 19% were lymphocytes. A further blood count on October 17, 1938, showed the leucocytes still to number 17,000, and toxic changes were still present. On October 20 the leucocytes numbered 16,000 per cubic millimetre.

On October 17 a pure growth of *Staphylococcus aureus* was obtained on culture from the urine. Cultures from the peritoneal fluid yielded a pure growth of *Staphylococcus aureus*. In the fæces no organism of the typhoid and paratyphoid *A* and *B* group was found. The Wassermann test elicited no reaction. On October 14, 1938, the Widal test was carried out and resulted in agglutination for *Bacillus typhosus* "up to 180", but when the test was repeated four days later this result was not confirmed.

No pathological changes were found in a microscopic section of the appendix.

X ray examination after a barium enema on October 18, 1938, revealed definite delay and dilatation in the terminal part of the ileum.

On November 4, 1938, the patient was still complaining of some intermittent pain in his abdomen, but no vomiting or nausea was present. His bowels were open twice daily. On examination the boy was pale, and a tender mass was palpable in the right iliac fossa. On November 25 he still had occasional pain and complained that his bowels had been opened after each meal. His weight at that time was 39 kilograms (six stone two pounds), and a tender mass was still present in the right iliac fossa.

X ray examination on December 21, 1938, revealed delay in emptying of the ileum and irritability of the caecum. A blood count gave the following information. The erythrocytes numbered 5,010,000 per cubic millimetre, the hæmoglobin value was 68%, and the colour index was 0·68. The leucocytes numbered 18,400 per cubic millimetre, 70% being neutrophile cells, 3% eosinophile cells, 7% monocytes, and 20% lymphocytes. No immature lymphocytes were seen. The erythrocytes showed microcytosis with a slight degree of hypochromia.

On January 6, 1939, the patient had improved. A thickening in the ileum was still palpable. His weight had increased to 42·1 kilograms (six stone nine pounds). On January 20 his diarrhœa had ceased. He had no abdominal pain and the thickened area in the ileum was less pronounced. On February 24 the patient was symptomless. He looked well, but still a slight thickening could be felt in the region of the terminal portion of the ileum.

Case II.

J.C., a male, aged fifty-nine years, a fitter's assistant, was seen on December 9, 1938, complaining of acute abdominal pain situated in the right iliac fossa.

The diagnosis of acute appendicitis appeared to be obvious. Consequently he was admitted to hospital, where his abdomen was opened by a gridiron incision. Before the peritoneum was opened underlying congested bowel could be seen. This was found to be the caecum, and it was delivered with some difficulty. Investigation showed that the whole of the caecum and the adjacent portion of the ascending colon for a distance of about five inches were congested and reddened. The surface vessels and lymphatics were distended, very thickened from the œdema. The appendix was involved to a less extent, and was obviously not a cause of the condition. This thickening did not involve the lower part of the ileum, which was normal up to the ileo-caecal orifice. The thickening appeared to be uniform and disappeared fairly abruptly into normal ascending colon. A slight amount of straw-coloured fluid was present in the abdomen. The appendix was removed and the abdomen closed without drainage.

After operation the patient's temperature was elevated up to 37·2° C. (100·2° F.), but subsided by lysis, becoming normal on the fifth day. It did not again rise and the patient was discharged on December 19.

A blood count was made on December 12 and gave the following information. The erythrocytes numbered 5,120,000 per cubic millimetre and the colour index was 0·98. The leucocytes numbered 16,400 per cubic millimetre, 72% being neutrophile cells, 3% being monocytes, and 25% being lymphocytes.

There was no reaction to the Widal test. *Bacillus coli communis* only was grown in cultures from the appendix.

On March 19, 1939, the patient was symptomless, and stated that he had had no pain or discomfort and no diarrhœa since leaving hospital. He commenced work about one month after his operation and has worked on since. Examination reveals no thickening of the ascending colon. It would thus appear that resolution has taken place.

Discussion.

While attention has been drawn to the presence of inflammatory tumours in the intestine by Moynihan[9] and Mayo Robson[10] in case reports in the early part of the century, the description of localized inflammatory tumours in the terminal portion of the ileum is attributable to Crohn[11] and his co-workers, as late as 1932, when this condition was first described as a clinical entity. Crohn then described terminal or regional ileitis as occurring in four types: (i) the acute type, simulating acute appendicitis; (ii) a type causing symptoms of ulcerative enteritis; (iii) a stenosing type causing small bowel obstruction; (iv) a type associated with persistent fistulæ in the right iliac fossa.

In 1936 Crohn[12] enlarged on his description of the disease and included involvement of the proximal part of the colon, either coincident with the involvement of the ileum or as a separate entity. He considered that in some of these cases extension of a colitis to the ileum had taken place.

Barbour and Stokes,[3] in 1936, reported a case in which multiple lesions were present in the small bowel, the highest being twenty-one inches from the pylorus and the lowest being four and a half inches from the ileo-caecal valve.

Pathology.

Crohn's disease is a non-specific inflammation involving all coats of the small intestine, followed in a later stage by connective tissue proliferation, converting the intestine into a thickened tube with a narrowed lumen. This is responsible for the obstructive symptoms and for the presence of the palpable mass in the right iliac fossa. Abscess formation from extension into the mesentery leads to the presence of fistulæ. In the acute stage the bowel is congested, œdematous and soggy, the serous coat being a blotchy red, with numerous subserous distended lymphatics. No exudate is present and no thrombosed vessels are apparent. On the mucous surface, according to Jackman,[1] there is a firm hæmorrhagic exudate.

Microscopic Examination.

Microscopic examination reveals a condition of simple intestinal ulceration. The mucosa is destroyed and replaced by fibrino-purulent exudate. Bacteria of the intestinal group are the only ones seen. In the deeper layers no bacteria are in evidence, but a pronounced acute inflammatory reaction is present.

The appendix in the case reported by Jackman showed no evidence of inflammatory changes. In the first case reported above, the absence of pathological changes in the appendix was also noted. In

the later stages of the disease the mucosa is atrophic. Superficial erosions and polypoid hyperplasia are noted.

Ætiology.

The disease is of a non-specific inflammatory type. The only organisms that have been isolated have been streptococci and *Bacillus coli communis*. In the first case reported above, a growth of *Staphylococcus aureus* was obtained from the peritoneal fluid.

In an experimental study Reichert and Mathes[13] have been able to reproduce a similar condition by injecting the subserous and mesenteric lymphatic in dogs with bismuth oxychloride, alone or combined with sodium morrhuate, with rose aniline dye or with silica. Intravenous injections of *Bacillus coli communis* were combined in some cases with the lymphatic injections. Similar sclerosis has not followed interference with the blood supply of the intestinal tract. This work suggests that the condition is due to chronic lymphœdema together with a chronic low-grade infection.

Clinical Features.

The disease appears to be more common in males than in females, and the age ranges from the early teens to the fifties. Erb and Farmer,[14] in 1935, however, described four cases of a condition presenting similar appearances, and no doubt of the same nature as Crohn's disease, which occurred in children ranging in age from two and a half to ten years. The symptoms vary with the stage of the disease. Acute appendicitis is simulated in its acute phase, and from this it is no doubt indistinguishable before operation.

In the ulcerative stage the intermittent abdominal pain, the frequent bowel actions and the presence of a palpable tumour should suggest correct diagnosis.

In the obstructive stage the diagnosis again becomes difficult.

The absence in the fistula stage of actinomyces should also lead to a strong suspicion as to the nature of the condition.

Radiographic Features.

Kantor[15] has summarized the radiographic appearance and has drawn attention to four features: firstly, a filling defect in the lower part of the ileum; secondly, what he described as "a peculiar taper point" proximal to the filling defect; thirdly, ileal stasis with dilatation of the loops proximal to the filling defect; and fourthly, "the string sign", which is a thin, irregular linear shadow extending from the last visualized loop of ileum to the ileo-caecal valve.

Differential Diagnosis.

In the differential diagnosis the following disorders must be considered: localized colitis, ileo-caecal tuberculosis, lymphosarcoma, Hodgkin's disease (the text-book information is doubtful), actinomycosis, carcinoma of the caecum, and, of course, most commonly appendicitis must be considered.

Treatment.

In the presence of obstructive symptoms resection appears the obvious solution. In the acute phase conservative measures appear to be reasonable, as spontaneous recovery has been noted.

Summary.

Two cases of Crohn's disease are reported, illustrating the acute phase of the disease in two distinct localizations. In neither case was diagnosis made prior to operation. In both conservative treatment was adopted, and appears up to the present (although admittedly the interval has been a short one) to have been justified; the progress subsequent to operation has suggested the likelihood of recovery. The literature has been shortly reviewed and summarized, and the clinical and diagnostic features have been briefly set out.

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(15) J. L. Kantor: "Regional (Terminal) Ileitis: Its Roentgen Diagnosis", *The Journal of the American Medical Association*, Volume CIII, December 29, 1934, page 2016.

Reports of Cases.

SEVERE TETANUS WITH RECOVERY.

By R. L. THOROLD GRANT, M.B. (Adelaide), M.R.C.P. (London), F.R.A.C.P.,
Honorary Physician to the Adelaide Children's Hospital.

THE publication of details of a single example of illness is of limited value; but I submit the following notes in

the hope that the lesson I learnt therefrom may be of use to others who have to deal with such a distressing disease.

Clinical Record.

A boy, aged eleven years, was admitted to the Adelaide Children's Hospital on February 22, 1939, with the history that four days previously he had complained of a very stiff neck. He felt better on the following day, but could not eat his breakfast because his jaw was stiff, and he could not open his mouth. He felt unwell on the following day, but attended school; he returned home at midday with a stiff neck, pain in the back and difficulty in opening his mouth. Later in the evening his jaw became more rigid, he had some toxic spasm of the leg muscles, and his back was a little arched. There had been a blister on one toe and an abrasion on another toe of about one week's duration. No other injury could be detected.

The boy exhibited a pronounced *risus sardonicus*. He could open his mouth only about half an inch. There was great rigidity of the neck muscles. The spine was slightly arched. The legs were stiff and held extended. The abdominal muscles were very rigid. He was quite conscious and rational. He was given an intramuscular injection of tetanus antiserum, which gave rise to a mild spasm. A sedative bromide and chloral mixture was ordered. When I saw him some hours later he did not appear to be very ill and was amusing himself by reading comic papers. I thought that he was probably suffering from mild tetanus; I was soon to be disillusioned. He had frequent tetanic spasms later in the day and was anæsthetized by rectal injection of "Avertin". A nasal tube was passed into the stomach for the administration of fluid food. The injections of "Avertin" were repeated as required, and use was made of "Sodium amytal" and "Luminal" in an attempt to control the spasms, which were becoming more frequent and more severe. Further injections of tetanus antiserum were given, although I felt that the control of the spasms was the most essential part of treatment and that tetanus antiserum at this stage was of doubtful value.

On February 24 his condition appeared much worse, and I then thought that the use of curare might be attempted. I telephoned to Dr. J. G. Sleeman, whom I knew to have a small supply of this drug, to seek his opinion. Dr. Sleeman told me that he would be frightened to use it on account of the danger of paralysing the respiratory muscles. He kindly told me that in his experience of the treatment of tetanus during his many years as superintendent of the Adelaide Hospital he had come to rely on paraldehyde aided by "Luminal" and "Sodium amytal" as the best antispasmodic drugs. So the rectal injections of "Avertin" were abandoned for those of paraldehyde; intramuscular injections of soluble "Luminal" were used and "Sodium amytal" was given by mouth. By these means the boy was kept asleep for most of the twenty-four hours of each day. I have done this before in the treatment of tetanus, but I have been defeated by the onset of bronchopneumonia.

On February 27 his temperature began to rise, eventually reaching 40·1° C. (104·2° F.). He had definite signs of bronchopneumonia at the base of the right lung. The boy appeared to be rapidly approaching death. I ordered "M and B 693" to be given by the nasal tube, with the hope that it might possibly influence the pneumonic process. A few hours later the boy appeared to be on the point of death. His respiration was rapid, the rate being 60 per minute. His breathing was laboured and there was a large secretion of mucus in his bronchial tubes. Then came the turning point, about twelve hours after the "M and B 693" had first been given; the temperature came down to 37·8° C. (100° F.), the breathing was less laboured. The boy was kept asleep throughout day and night; any return of consciousness with the accompanying spasms was the signal for more paraldehyde, which was now being given through the nasal tube. This treatment continued for days, until March 5, when the boy's temperature fell to normal and we stopped using "M and B 693". The use of paraldehyde continued until March 13, by which time spasms had ceased. The boy, on being allowed to awaken from his long sleep, was found to be quite irrational and disorientated, but at the end of a further week his mental condition had returned to normal. His convalescence was interrupted by a crop of boils on the head and neck and the occurrence of a postural foot-drop; but these conditions responded to treatment, and by April 17 he was walking about and was in excellent health.

Discussion.

During the course of this illness the following amounts of drugs were administered to the patient:

"Avertin", 12 cubic centimetres.

Morphine, 16·0 milligrammes (¼ grain).

"Sodium amytal", 2·1 grammes (31½ grains).

"Luminal", 3·2 grammes (48 grains).

Atropine, 0·5 milligramme (1/120 grain).

Paraldehyde, 577·5 cubic centimetres (154 drachms).

Bromide and chloral mixture, 101·3 cubic centimetres (27 drachms).

"M and B 693", 47·5 grammes.

The boy received 240,000 international units of tetanus antiserum. He had 528 tetanic spasms.

I have never seen anybody recover who was so seriously ill as this boy. The turning point was the combating of the bronchopneumonia by the use of "M and B 693".

Acknowledgement.

Finally I should pay tribute to the unflagging zeal of my house physician, Dr. Irene O'Loughlin, in her battle for the boy's life, and to the nursing staff of the Adelaide Children's Hospital for their very large share in the credit of his recovery.

Reviews.

BIOCHEMISTRY FOR MEDICAL STUDENTS.

WITH the many excellent text-books on biological chemistry now available there might not seem to be a place for an entirely new work, but "Biochemistry for Medical Students", by W. V. Thorpe, should find a warm welcome.[1] It can be said that this is one of the best books on biological chemistry available for medical students and for medical graduates who wish to know the present position of this very important subject.

It is remarkably concise, but with ample detail for a good understanding of the subjects treated. Little of importance up to the date of its publication seems to have been missed. There are not many mistakes, those found being mostly in chemical formulæ; for example, the formula for stercobilin and those for ergosterol and calciferol are incorrect.

Physico-chemical principles are dealt with very well in the first four chapters, and then the more chemical aspects are developed logically. The very important subjects of foods and food requirements are treated in much greater detail than is usual in the smaller text-books.

One serious omission is the whole subject of respiration. The author states that this is because this subject is always described in detail in text-books of physiology. This is quite true, but the omission does somewhat lessen the value of the book in that the picture of the chemical changes in the body is incomplete.

[1] "Biochemistry for Medical Students", by W. V. Thorpe, M.A., Ph.D.; 1938. London: J. and A. Churchill Limited. Large crown 8vo, pp. 465, with illustrations. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, JUNE 3, 1939.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE PSYCHOLOGICAL TREATMENT OF CRIME.

MEDICAL PRACTITIONERS have, or should have, more than a passing interest in the prevention of crime. As units of a society, the majority of whose members have rightly or wrongly created laws for their own comfort and protection, they are naturally concerned in the suppression of antisocial acts by persons who for one reason or another either cannot live or do not wish to live within the law. But they have another and more urgent interest; they know that many criminals and asocial persons suffer from a psychological illness or from a defect which may in certain circumstances be arrested in its development, or mitigated or cured. They know that many a psychological illness can be prevented, and they realize that the social and economic conditions predisposing to crime may be bettered. In this connexion readers should be reminded of an important study in the psychology of delinquency by Dr. Grace W. Pailthorpe in 1932. Dr. Pailthorpe's study was the subject of a special report issued by the Medical Research Council of Great Britain, and this report was discussed in THE MEDICAL JOURNAL OF AUSTRALIA of November 26, 1932, at page 665. From the Home Office, London, there now comes a report by Dr. W. Norwood East and Dr. W. H. de B. Hubert on the psychological treatment of crime.[1]

Dr. East and Dr. Hubert's report is a book of 166 pages; it is full of most interesting information and includes many case histories with comments. In this place it will be possible to give little more than an outline of the scope of the investigation and of the findings. Those who are interested in the psychological aspect of medicine, whether they are psychiatrists, physicians or general practitioners, will be well advised to study the whole report, for it is one of the most important contributions to the subject that has been made in recent years. Obviously the first thing to be determined was the type of prisoner who was to be treated. Medical officers of prisons were instructed to submit for examination any prisoner who was thought to be suitable for psychological investigation and treatment. The prisoner was then transferred to Wormwood Scrubs Prison, near London. Here he was examined in the first place by Dr. H. T. P. Young, the senior medical officer of that institution. He was then seen in consultation by Dr. East and finally treatment was carried out by Dr. Hubert. The prisoners selected were generally under forty years of age and were serving sentences of not less than six months in respect of indecent exposure, homosexual or abnormal sex crimes, of arson or other crimes thought to be due to obsession or hysterical reactions or some other remediable condition. Adolescents who showed evidence of pronounced mental instability during detention were to be considered suitable for submission; but no prisoner was to be submitted for psychological treatment who was certifiable under the *Lunacy Act* or the *Mental Deficiency Act*. It was also determined that the prisoner should be willing to be treated and likely to cooperate in the treatment. It is pertinently remarked that "it is to be remembered that the psychiatrist is not merely

[1] "Report on the Psychological Treatment of Crime", by W. N. East, M.D., F.R.C.P., and W. H. de B. Hubert, B.A., M.R.C.S., L.R.C.P.; 1939. London: His Majesty's Stationery Office. Royal 8vo, pp. 169. Price: 2s. 6d. net.

interested in mental disease and abnormalities of conduct. He is also deeply concerned with removing the difficulties which may give rise to mental illness or cause conduct which, although not necessarily abnormal, may become harmful to the patient or the community." Selection, clearly, would be difficult, and East and Hubert explain in detail some of the difficulties—some prisoners applied for treatment out of curiosity; some in the hope of avoiding work and to obtain preferential treatment in prison; and some, awaiting trial, exploited the psychologists to produce evidence favourable to themselves. In all, 406 prisoners were investigated, and of these, 214 were approved for treatment. The investigations are described in two sections; the first has to do with general and the second with sexual offences. An explanation of the method used is given under three headings. In the "simple method" an attempt is made to give the patient a better intellectual grasp of his personality, his difficulties and his previous offences. In the "complex method" an attempt is made to allow the patient to see that he is repeating in his reactions to the therapist, prison officials and other persons a form of behaviour which is specifically related to the behaviour he has shown in the past, and which has led, and may continue to lead, to delinquency. Ancillary methods included variation of prison life by the alteration of conditions of association, privileges and occupation. Sometimes assistance and supervision were carried out after the patient's discharge from prison by the Central Association for Mental Welfare; sometimes treatment was continued at the department of psychological medicine at Saint Thomas's Hospital. The general conclusion of the work is that psychotherapy as an adjunct to an ordinary prison sentence appears to be effective in the prevention or in the reduction of the chance of future antisocial behaviour, provided (and this proviso is obviously most important) the cases to which treatment is applied are carefully selected. The result of the investigation, very wisely, is not shown statistically, for the longest period for which any subject had been out of prison was four years; in most cases the period was much shorter.

> Psychotherapy is, and is likely to remain, a specialized method of treatment usefully applied to but a comparatively small number of disorders. It should only be recommended, whether the disorder of thought or behaviour is likely to lead to antisocial behaviour in the future or not, if previous experience shows it to be necessary, likely to be effective and, considering the particular circumstances of the case, advisable.

After further discussion on the limitations of psychotherapy we are told that:

> The future development of psychotherapy may be closely connected with the continuous, detailed, and expert observation and study of behaviour and the control, and modifiability at will, of the total environment of the patient during treatment which only psychiatric supervision can supply.
>
> Moreover, it is more than probable that . . . general psychiatric methods of treatment are applicable to a very much larger number of cases and to a wider range of conditions than is psychotherapy alone. In addition to this, the psychiatric approach can aid in the prevention of crime and the general public welfare in ways which amend conduct without necessarily effecting any moral change in the offender. When the particular circumstances indicate it, psychiatric supervision and care during the period of detention should not be withheld because it is not likely to reduce the chance of crime on discharge. More important than this, study of the hereditary and environmental causes of crime and investigation of the special disorder of behaviour found amongst criminals may produce far more valuable results than could be obtained by confining attention to the reformation of any particular individual.

In view of this statement it is not surprising to find that East and Hubert suggest that the efficiency of the prison system and advance in criminology could be aided by the creation of a special institution for the care, study and treatment of a selected group of criminals.

Work such as that described in this report is not work of supererogation, nor is the suggestion for the establishment of special institutions for the psychiatric study and treatment of criminals Utopian. The application of psychiatry and its methods to criminology is both logical and inevitable, though in some places we may have to wait a long time before this is done. Its use in different places will depend on the understanding and ideals of those in governmental control. In 1932 we wrote:

> If law makers are not prepared to look at crime from the psychological point of view, they will probably agree that prevention is better than cure. If they agree thus far, they must consent that when a person is found to be

so defective that he is foredoomed to asocial behaviour, he should be treated, and if treatment is not effective, should be placed in such surroundings that asocial behaviour will not take place. To know that a person, through lack of mental control, is destined for a life of crime, and to fail to prevent him from embarking on such a career is to share in his subsequent guilt. Thus we must acknowledge that some of the crimes of society are in part crimes of society against itself.

Since society is thus morally bound to do something for the criminal, it is much more bound to seek, and having found, to destroy the conditions of its own making which lead to a great deal of what is known as crime. We thus come to the logical conclusion that, necessary though the application of psychotherapy and the methods of psychiatry to certain types of criminal undoubtedly are, it will in the long run be ineffective unless the conditions in the individual and in society which predispose to crime are attacked.

Current Comment.

INJURIES TO THE EYE RESULTING FROM CHILDBIRTH.

AT the first annual meeting of the Ophthalmological Society of Australia (British Medical Association) Dr. J. Bruce Hamilton, of Hobart, read an important paper in which he discussed a series of injuries to the eye which had resulted from childbirth. He based his remarks on the records of 6,240 patients, suffering from eye conditions, who had come under his notice. Among these patients were thirty-four who had among them 94 lesions attributable to birth injuries. This series is so remarkable that the attention of all medical practitioners engaged in obstetrical practice should be drawn to it. We are grateful to Dr. Hamilton and to the Ophthalmological Society for permission to discuss the injuries in these pages. The cases were divided into eight groups. In the first group were five fractures of the skull which gave rise to optic atrophy. The second group, comprising damage to the lids and soft parts, included one instance each of facial paralysis, Horner's syndrome, and lesion of the lid; four cases of ptosis; and three cases each of third nerve and of sixth nerve paralysis. In the third group, that of damage to the globe, there were one case of microphthalmus and two of myopia. The fourth group, that of damage to muscles, included seven cases of nystagmus, seventeen of convergent strabismus; there was one case each of ocular torticollis and of convergence insufficiency; there were two cases of muscle overaction and twenty of *amblyopia ex anopsia*. In the fifth, or damage to cornea, group there were fourteen cases of astigmatism, three of corneal nebulæ and one each of corneal abrasion, rupture of Descemet's membrane and of *keratitis sicca*. Damages to the iris in the sixth group included one case of hyphæma and three of anisocoria. In the seventh group there was one case of damage to the lens, and in the eighth one of damage to the retina. In twenty of the thirty-four cases comprising the series there was a history of forceps having been used, and in eleven it was doubtful whether forceps had been used or not. In only two cases was it certain that no forceps had been used at the time of delivery. Particulars of the vision in the 66 eyes of the series were given, and eight eyes had a vision of less than $^{6}/_{60}$. An analysis of the cases in which forceps had been applied in relation to the type of home of the patients showed that six deliveries were those of patients from poor homes; in four cases forceps were used, and in two application was "doubtful". Thirteen patients came from "moderate" homes; in eight cases forceps were used, in four their use was "doubtful" and in one forceps were not used. Six patients belonged to "good" homes; forceps were used in five instances, in one their application was doubtful. Eight patients belonged to "very good" homes; in three instances forceps were used, in four their use was "doubtful" and in one they were not used. Five of the thirty-three patients had permanent intracranial as well as ocular damage, and one had damage to a limb.

This is a melancholy recital and one which surely calls for little comment. If forceps must be applied they should be applied *secundum artem*. Forceps when properly adjusted will not exert pressure directly on the globe of the eye. Probably most trouble is experienced with occipito-posterior presentations, but this is not the occasion for a discussion on that subject. Readers will find an important paper by Professor Chassar Moir, of the University of Oxford, in *The British Medical Journal* of September 10, 1938, at page 555; it is worthy of careful study. Obstetricians will find in Hamilton's list of lesions food for serious thought; and they will be able to draw conclusions from it as well as anyone else.

A DENTAL THESIS.

MISS ANNIE PRAED has presented for the degree of Doctor of Dental Science of the University of Sydney a thesis on the problems surrounding the excessive resorption of the alveolar ridge. In this essay the writer makes valuable suggestions as to the methods by which, in her opinion, denture restoration may be achieved. Her thoughtful conclusions will naturally be of the greatest interest to dental practitioners and also to the increasing number of doctors who realize the important connexion between dental efficiency and the general health. It must be admitted, however, that only those medical men who have a greater knowledge

of dental science than the general run of doctors possess will be able to appreciate the full force of her observations.

Miss Praed points out that excessive alveolar atrophy, accompanied by resorbed, pendulous or hypertrophied ridge mucosa, may be diagnosed by visual, digital and X ray examination. It is this absence of the residual ridge and the consequent abnormal position of the muscles known as "border tissues" which make the fitting of stable artificial dentures a matter of some difficulty. Improperly fitting and unstable dentures are a direct cause of impaired digestion resulting from incomplete mastication; and the continued attempt to maintain wobbling plates in their proper position makes speech difficult and indistinct, besides producing a painful self-consciousness, which reacts unfavourably on the patient's nervous system.

It is therefore necessary by the proper care of natural teeth, both deciduous and permanent, to prevent or to postpone as far as possible the wearing of artificial teeth. This, as medical and dental knowledge increases, may be brought about to a greater degree than in the past by improved antenatal care, improved diet, oral prophylaxis and preventive dentistry. All systemic disorders of the body which lower the general resistance or are associated with impairment of mineral metabolism call for careful supervision; and from the surgical aspect the operator must recognize the importance of conserving the maximum amount of alveolar bone and the necessity for producing the least possible amount of scar tissue. By these means the best support is provided for dentures subsequently worn. A well-fitting denture will then interfere to the least possible extent with the tissues upon which it rests and will yield the greatest service in mastication.

Miss Praed describes methods of denture construction which, in her opinion, will provide sufferers from excessively resorbed alveolar ridges and (for them) abnormal muscular attachments with dentures which will fulfil their function in a manner hitherto possible only amongst edentulous patients of the class which dentists label as ideal, and in which mastication, deglutition and phonation are unhampered. Miss Praed appends a list of twelve cases showing the results of the procedures she recommends. The text of the thesis gains an added value from the inclusion of many reproductions of X ray films, photographs and anatomical diagrams.

"M AND B 693" IN MALARIA.

READERS of these columns have already had their attention drawn to the work of Chopra and Das Gupta on the use of the drugs of the sulphonamide group in malaria (THE MEDICAL JOURNAL OF AUSTRALIA, August 27, 1938, page 345). These workers experimented with monkeys infected with *Plasmodium knowlesi*. They showed that the injection of large doses of "Soluseptasine" or "Prontosil" was more effective than treatment with "Atebrin" in this infection, but that the dosage required was disproportionately large in comparison with the normal dosage for man. In more recent experiments they have used "M and B 693" (2-sulphanilylamido-pyridine).[1] From the usual dose of this drug given to man they calculated that an ordinary daily dose for a monkey weighing four kilograms should be about 0·13 gramme. The drug was injected intramuscularly in an oily suspension. Three monkeys were heavily infected with *Plasmodium knowlesi*. The first was given 0·15 gramme of "M and B 693" on four successive days; the second was given 0·1 gramme on four successive days, and the third 0·05 gramme on five successive days. The day following the final injection either no parasites or very few were found. The blood of the first monkey was examined regularly after treatment, from December 17, 1938, to February 24, 1939; the second was examined twice a week from January 22, 1939, to February 27, 1939. In neither instance were parasites found. There is no record of the progress of the third monkey beyond the day after the completion of the treatment (February 24, 1939). On this date no parasites were found in a blood film.

Chopra and Das Gupta point out that monkeys almost invariably suffer a relapse in ten to fifteen days after the cessation of treatment with "Atebrin" and that they die of the disease if the treatment is not repeated. The new drug seems to be more effective than "Atebrin". Chopra and Das Gupta suggest its trial in human malaria.

We should like to see the results of treatment with "M and B 693" of a larger series of animals before we express sanguine hopes concerning its value. At the moment we can only agree with Chopra and Das Gupta that the results are encouraging and that a trial of this treatment in human malaria is warranted. Further reports will be eagerly awaited.

THE VEGETATIVE NERVOUS SYSTEM IN ACRODYNIA.

ACRODYNIA is a curious disorder which occurred in epidemic form in Paris in 1828-1829, shortly before the influenza pandemic of 1830. Since that time it has been of infrequent occurrence, but subsequent outbreaks have always been associated with influenza. The nature of the disease is unknown. The outstanding features have been peripheral neuritis, with œdema and an erythematous rash. The manifestations may be psychical, myoclonic, paralytic, sensory, trophic or vasomotor. Lethargy, delirium and mania have been recorded. The association with influenza has been comparable with similar relationships of poliomyelitis, neuritis, meningitis, myelitis and encephalitis to influenza epidemics. Outbreaks of *encephalitis lethargica* have

[1] *The Indian Medical Gazette*, April, 1939.

been recorded exhibiting typical manifestations of acrodynia, including erythematous rashes, conjunctivitis, and facial and peripheral œdema.

R. Day, J. R. Smith and W. O. Klingman state that while clinical evidence of implication of the sympathetic nervous system is generally conceded, they have no knowledge of any observations demonstrating sympathetic dysfunction quantitatively.[1] Tests for activity of the vegetative nervous system are, particularly in children, difficult to evaluate. Day and his associates have made observations in three cases of this disorder. They enumerate, as evidences of sympathetic hypertonicity in acrodynia, tachycardia, sweating, hypertension, hyperglycæmia, and psychic instability. Such manifestations as increased nasal secretion and salivary flow and possibly constipation and abdominal pain are attributable to parasympathetic over-activity. Other phenomena, such as muscular weakness and paræsthesia, suggest widespread general involvement of the nervous system. In the choice of a test for the estimation of sympathetic hypertonicity, Day and his colleagues were influenced by two signs which are most likely to be present, namely, tachycardia and hypertension. Special tests were made of the pulse rate, as previously H. D. Blackfan and C. K. McKhann had observed that the pulse rates of patients suffering from acrodynia did not vary during sleep or with crying, a fact which is in contradistinction with what occurs in normal persons. Day and his associates remind us that, in children, the emotions constitute the greatest obstacle to the customary pharmacological tests of sympathetic function. Accordingly they relied mainly on emotional tension rather than entirely on drugs for stimulation. Changes in the pulse rate indicated the reaction of the child to the stimulus, whether the latter was emotion or a drug which acted on the vegetative system. The authors found a great change in the rate of the pulse associated with emotion in a normal subject and a lack of response in cases of acrodynia. The response of control subjects to drugs was difficult to estimate. The factor of emotion had to be eliminated, a condition not easy of attainment. It was noted that acceleration of the pulse induced by vigorous crying was slight in subjects of acrodynia as compared with normal and control individuals; but after recovery from acrodynia the response of the pulse rate to emotion became normal. Because the autonomic nervous system consists of two antagonistic parts and, as its activity is expressed through two chemical mediators (acetylcholine and epinephrine) Day and his associates acknowledge that the number of possible theories regarding the nature of the functional disturbance associated with acrodynia is great. The results of atropine sulphate injections suggest that the vagus nerve is functioning, as inhibition of vagus effect by this drug resulted in a further pronounced rise in pulse rate. The high blood pressure and the heart rate might possibly be secondary to vaso-constriction, which in turn might be due to an unknown toxic agent or to over-activity of the sympathetic division of the vegetative nervous system. V. L. Evans, in 1937, reporting a case of tumour of the adrenal medulla, remarked that high blood pressure and great rapidity of the pulse occurred in association with integumentary changes in the extremities. Day and his associates consider that these integumentary changes resembled those of acrodynia. However, cutaneous changes have not been noted in other reports of similar tumours. The profuse sweating which occurs in the majority of cases of acrodynia is against the theory that acrodynia is caused by an over-secretion of adrenaline. Changes in the reflexes, muscular weakness and areas of anæsthesia are suggestive of disorders of the central nervous system; but Day and his colleagues point out that in such an event it is remarkable that anatomical changes have not been revealed at autopsy. They consider that failure of the sympathico-adrenal response to be elicited by emotion might arise from the fact that the sympathetic nervous system, in a patient suffering from this disorder, is already so much over-stimulated that it cannot react to additional stimulation. Such over-activity would explain the constant condition of constriction presumed to exist in the arterioles.

This communication, of which merely an outline has been given, somewhat advances our knowledge of an obscure condition. The term "acrodynia" has been used to embrace cases of "pink disease" (erythrœdema or erythrœdema polyneuritis). But other conditions cannot be included in that category. It is imperative that the position be clarified as to whether the names indicate different disorders or not. The evidence that vitamin deficiency is responsible for the disease (or diseases) is not entirely convincing.

[1] *American Journal of Diseases of Children*, February, 1939.

NATIONAL HEALTH INSURANCE.

As this issue of the journal goes to press we have received for publication the following statement from the General Secretary of the Federal Council of the British Medical Association in Australia.

The Contract Practice Committee of the Federal Council met the Commonwealth Minister for Health and Social Services, Sir Frederick Stewart, and the members of the National Insurance Commission, Mr. J. Brigden and Mr. H. Green, at the Commonwealth Offices, Treasury Gardens, Melbourne, on Wednesday afternoon, 17th instant.

The members of the committee present were: Dr. T. A. Price (Chairman in the absence of the President, Sir Henry Newland), Dr. H. R. R. Grieve, Dr. C. H. Dickson, Dr. J. Robertson, Dr. R. J. Verco, Dr. F. W. Carter and Dr. J. G. Hunter, General Secretary of the Federal Council.

The views of the profession in regard to health insurance were conveyed to the Minister and a friendly discussion then ensued.

Abstracts from Current Medical Literature.

SURGERY.

Modified Double Enterostomy in the Treatment of Intussusception.

BARNES WOODHALL (*Archives of Surgery*, June, 1938) states that the following methods of treatment have been used in gangrenous or irreducible intussusception in infants and young children: resection with lateral or end-to-end anastomosis; resection with double enterostomy (Mikulicz); resection of the intussusceptum through an incision in the intussuscipiens, with or without lateral anastomosis; lateral anastomosis in the neighbourhood of the lesion with secondary resection; ileostomy with secondary resection; lateral anastomosis in the neighbourhood of the lesion with secondary sloughing or healing; enterectomy of the base of the invagination or simple suture after mesenteric ligation, followed by spontaneous sloughing; incision in the wall of the intussuscipiens to permit manual reduction, followed by one of the aforementioned methods if necessary. The author has examined the statistics from various clinics and from various individual reports, and states that the mortality rate was 70% in 417 cases in which the patients were treated by one of these operative procedures. In his opinion the surgical technique adopted in the treatment of irreducible or gangrenous intussusception occurring in early life should permit: rapidity of execution, complete removal of the irreducible or gangrenous mass, control of concomitant intestinal obstruction, control of loss of fluid, restoration of the continuity of the intestinal canal. He reports two cases in which he adopted the usual Mikulicz procedure of double enterostomy, modified by a large lateral ileo-colic anastomosis at a point about eight centimetres from the exteriorized ends of the bowel. Both patients recovered and the author expresses the opinion that the Mikulicz resection appears to fulfil the requirements of the "optimal surgical technique".

Recurrent Dislocation of the Sterno-Clavicular Joint.

A. S. BLUNDELL BANKART (*The British Journal of Surgery*, October, 1938) has in the past few years treated four young women suffering from recurrent dislocation of the sterno-clavicular joint, and gives the details of the operation performed by him. He separates the periosteum and capsule from the front of the sternum and the inner end of the clavicle and turns it down. He bores two holes in the inner end of the clavicle and two in the sternum and, using a strip of *fascia lata* passed through the holes, he binds the joint in such a way that the clavicle is pulled back into its normal position. He states that the four patients operated on regained full use of the arm in a few weeks, and in no case has there been any recurrence of the dislocation.

Spondylolisthesis and Spondyloschisis.

G. E. PFAHLER AND J. H. VASTINE (*Surgery, Gynecology and Obstetrics*, November, 1938) discuss the radiology and embryology of the lower part of the spine, with particular relation to the interpretation of skiagrams. Great difficulty is experienced when, after slight trauma, the patient goes about his usual duties for some days or weeks and then, after consultation with lawyers, begins to complain of symptoms which grow progressively worse. A radiological examination of the spine of such a patient may reveal a displacement of a vertebra with appearances suggesting a recent fracture, and in such circumstances it is most difficult to assess the effects of recent injury. The first essential is a set of good films taken in various planes, including the oblique; and in the interpretation of these, each line in the vertebra at the site of injury should be compared with those above and below. The intervertebral disk will rarely show pathological changes in a skiagram taken immediately after an injury, hence its appearance indicates a preexisting pathological change. Predisposing causes of spondylitis are: (i) unilateral or bilateral defects in the neural arch of the last lumbar vertebra, especially between the superior and inferior articular processes; (ii) fracture of the superior sacral or lowest lumbar articular process; (iii) absence or asymmetry of the lumbo-sacral articular processes; (iv) increased obliquity either of the sacrum as a whole or of its superior articular facets; (v) pressure deformity of the last lumbar vertebra as a result of prolonged strain; (vi) pathological processes affecting bones, joints or ligaments at the lumbo-sacral junction. Trauma as an exciting cause is of the nature of long-continued repeated slight trauma or strain, the bony changes usually being of a character to support this view. Spondyloschisis or defect of the interarticular neural arch is by far one of the most important predisposing factors. The defect may be unilateral or more often bilateral, and is nearly always due to the lack of fusion of the epiphyseal centres. The great majority of cases occur in the third, fourth and fifth lumbar vertebræ. Willis found this defect in 7·3% of 748, and Turner and Tchirkin in 4·28% of 748 cases. It was bilateral in 6·5% of 1,496 cases. With two exceptions it was in the last presacral segment and more anomalies were found in those spines which had 25 presacral segments instead of the usual 24. In the former group the lumbo-sacral disk is characteristically thinner than the average. In the series the incidence did not increase with age, a fact which indicates a congenital origin. All authors agree that the fifth lumbar vertebra is most commonly affected. Willis found this incomplete neural arch in 10% of 100 patients complaining of low back pain, and Neugeebauer found it in 5% of his specimens, the fifth lumbar vertebra being involved in the majority.

Treatment of Undescended Testes.

CHARLES E. REA (*Surgery*, October, 1938) suggests the following plan for the treatment of undescended testes. Treatment may be deferred until the patient is nine to eleven years old. There is no objection to operation on a patient with uncomplicated retained testis at an earlier age, but operation is unnecessary. The presence of a large associated hernia may necessitate earlier surgical intervention. The presence of an undescended testis precludes the use of a truss and the injection of sclerosing solution in the treatment of inguinal hernia. In all uncomplicated cases of undescended testis it is suggested that a trial of anterior pituitary-like hormone substance be made before surgical procedures are adopted. Possibly the determination of gonadotropic hormone in the urine before the treatment will aid in the selection of patients for this trial. While the available gonadotropic substances are well standardized, the dosages and the interval of injection prescribed by various authors are rather empirical. If after a course of treatment (the dosage *et cetera* varying with the preparation used) and observation over six months no results have been observed with hormonal therapy, surgical treatment is advised if the patient is nine years or older.

Recurrent Dislocation of the Shoulder.

ERNEST W. HEY GROVES (*The British Journal of Surgery*, October, 1938) expresses his surprise at the number and complexity of the operations proposed for recurrent dislocation of the shoulder. He is impressed with the care and thought given to these methods and does not doubt that their use in skilled hands would yield a high proportion of success. He cannot believe, however, that such complicated methods are really necessary. They all involve large incisions, a free opening of the joint, and the sacrifice or at least the injury of some of the important muscles about the shoulder. Since 1923 he has been using a much simpler operation, based on the simple sling operation of Clairmont. In this operation a strip of *fascia lata* one and a half inches wide is placed under the shoulder joint, up and around both anteriorly and posteriorly, and its ends are sewn together over the acromion process. The technique is simple, necessitating three short incisions, all three-quarters of an inch long. The first is made over the

anterior border of the deltoid muscle, about one inch below the coracoid process. The second is made posteriorly over the point of a pair of artery forceps pushed through the anterior incision and through the quadrilateral space. The third is made over the acromion process and the points of artery forceps are made to emerge through this incision from the anterior and posterior incisions. A piece of ribbon gauze is threaded through and around and is used to determine the length of the fascial graft required. The author's cases have been ten in number and success has been uniform, the course of recovery being quite smooth.

Swelling of the Brain in Head Injury.

P. SHAPIRO AND H. JACKSON (*Archives of Surgery*, March, 1939) report a series of observations on swelling of the brain in injury to the head. They have estimated the amount of cerebro-spinal and extra-parenchymatous fluid in normal brains and in brains of persons who died as a result of head injury. In cases of head injury they expected to find an increase of fluid in the sub-arachnoid space, but found scarcely enough fluid to permit of its measurement. In normal heads the fluid measured from 30 to 60 cubic centimetres. In the heads of persons with alcoholic "wet brain" or of those who died of congestive heart failure or renal failure the fluid measured 150 to 160 cubic centimetres. In brains of cerebral trauma there was, however, a condition of internal traumatic hydrocephalus, the ventricles being dilated to about twice their normal size and the contents ranging from 30 to 60 cubic centimetres of fluid. The intraparenchymatous water content of a series of brains was estimated, a whole cerebral hemisphere being dehydrated to a dry residue of constant weight. The traumatized brain was found to be drier than the normal brain and the normal brain drier than the alcoholic or "wet" brain. The brains from traumatized heads were heavier than normal, yet gave up less water and gave up what they did yield with more difficulty. This may possibly be explained by a shift of parenchymatous fluid from an interceHular to an intracellular position. A second explanation is that the extra weight is accounted for by innumerable petechial hæmorrhages into the brain substance. The authors checked the latter possibility by determining the iron content of a second group of brains. They found that the traumatized brains contained more blood than either the normal or the "wet" brains. It was calculated that the traumatized brains in some instances contained 37·8 cubic centimetres more blood than the normal brains. It was not determined how much of the blood in a traumatized brain was inside the vessels and how much was extravasated or functionless. "The brain may have more blood within it yet suffer functional cerebral anæmia". Though the authors do not care to draw any general conclusions from their observations in regard to the efficacy of various therapeutic procedures, they make therapeutic suggestions from their observations on pathogenesis. The patient with an injured head is suffering primarily from uncontrolled internal hæmorrhage within the cranial cavity. As the multiple extravasations of blood, together with some intracellular binding of water and the ventricular dilatation, begin to cause swelling of the brain, the brain tissue, even without treatment, makes a spontaneous effort to bring about compensation by decreasing the fluid in the subarachnoid spaces and by decreasing the quantity of intercellular fluid within the brain substance. Lumbar puncture may assist in the first process and the intravenous administration of sucrose in the second. When the damage has been too great, both the spontaneous and the applied therapeutic mechanisms fail and the patient dies. Dehydration is the proper treatment. Yet it must be recognized that the water binding may be in part a salutary physiological defence reaction of the injured cells and that it should not be disturbed too vigorously. The authors think that possibly the limits of usefulness of chemical methods of dehydration have been reached. They suggest that the dilatation of the lateral ventricles by the shutting off of the foramens is suggestive; and they add that ventricular puncture and drainage may be a useful method for the correction of cerebral compression. Procedures directed to the decreasing of parenchymatous hæmorrhage are unquestionably of value. These include: (*a*) absolute rest; (*b*) the avoidance of abrupt reduction of intracranial pressure by lumbar puncture within the first six hours, because it is this pressure which diminishes hæmorrhage; (*c*) limitation of intravenoclysis at first to small quantities, lest the raising of blood pressure cause recurrence of hæmorrhage; (*d*) small blood transfusions for patients with severe shock.

Omental, Mesenteric and Retroperitoneal Cysts.

L. BERGER AND R. E. ROTHENBERG (*Surgery*, April, 1939) have reviewed eighteen omental, mesenteric and retroperitoneal cysts operated on between 1915 and 1938. They have included only cysts which had no connexions with any adult anatomical structure. All cysts of this type should be regarded as retroperitoneal, for embryologically and pathologically they have a similar origin. Three of the cysts were omental, five were mesenteric and ten were behind the posterior peritoneum. Seven patients were males and eleven were females. Ten of the cysts occurred in patients under thirty years of age. Symptoms may be acute or chronic. The former are often caused by hæmorrhage into the cyst or by rupture of the cyst wall. The chronic symptoms are usually mild and due to the progressively growing tumour. X ray examination is important as an aid in differential diagnosis, for the exclusion of lesions of the alimentary and renal tracts. Omental cysts are usually large, thin-walled and multiloculated, and contain sero-sanguineous fluid; they tend to rupture easily. Mesenteric cysts are thick-walled, do not rupture easily, but tend to cause intestinal obstruction. If they arise from the mesentery of the small bowel they usually contain chylous fluid. Cysts arising from behind the posterior peritoneal wall grow to huge dimensions, are thin-walled and occasionally rupture; they most often contain straw-coloured or sero-sanguineous fluid. Microscopic examination yields little information regarding the origin of these cysts. All the 18 patients in the authors' series recovered from operation. The cysts should if possible be completely removed. If this cannot be done they should be marsupialized, or incised and drained.

Primary Streptococcal and Pneumococcal Peritonitis in Children.

E. T. NEWELL (*Surgery, Gynecology and Obstetrics*, April, 1939) point out that in the literature the mortality figures for primary streptococcal peritonitis average from 80% to 100%, and for primary pneumococcal peritonitis from 40% to 65%. He reports two cases, one of each condition, in which recovery occurred, and states that the result in these two instances offer hope that the high mortality rates for these conditions will be considerably reduced. In the first case the patient, a girl, aged six years, suffered from acute symptoms, which led to a diagnosis of acute appendicitis with peritonitis. At operation generalized peritonitis was found and pneumococcus Type I was isolated by culture from the pus two days later. Treatment consisted of the intravenous injection of 295,000 units of antipneumococcus rabbit serum given at intervals of two hours over a period of twelve hours. Recovery was stormy and protracted; consolidation of the lower lobe of the left lung occurred and intestinal obstruction made another laparotomy necessary. The second patient was a baby, born prematurely. At the age of two months he became acutely ill with a respiratory infection. Subsequently generalized peritonitis made its appearance. Purulent material obtained by puncture was found to contain β streptococci. Sulphanilamide was then administered, first of all intravenously, then intraperitoneally and later by the subcutaneous route. The infant recovered and was discharged from hospital one month after the onset of the peritonitis.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Queensland Branch of the British Medical Association was held at British Medical Association House, Wickham Terrace, Brisbane, on March 31, 1939.

Sterility.

DR. KENNETH WILSON read a paper entitled "Experiences in the Investigation of Sterility". This paper was published in the issue of May 20, 1939, at page 754.

DR. HUGH MCLELLAND thanked Dr. Wilson for his paper and congratulated him on the great amount of work he had carried out over many years. He knew Dr. Wilson had always been interested in this work. Sterility seemed to be a greater problem today, when normal families were not desired, than ever before. Many women reported for investigation after a term of contraception. Dr. McLelland wondered why so many successes were reported as a result of the use of lipiodol. Dr. Wilson did not suggest in what way it had its beneficial effect. Dr. McLelland thought the occasional successes following dilatation of the cervix were due to the actual stimulation of the uterus. He packed the uterine cavity with gauze and left it for twenty-four hours so that a miniature labour occurred.

Dr. McLelland disagreed with Dr. Wilson in regard to the significance of uterine hypoplasia, which so commonly accompanied primary sterility. Although the infantile type of uterus was not very commonly encountered, the small cochleate and adolescent uterus was very frequently found in these cases. He had not found that glandular therapy was strikingly successful, partly because the patients did not report early enough and partly because the underlying cause was often a psychic one. In many cases the adolescent uterus would develop normally under the conditions of happy marriage. Dr. McLelland had not found œstrin very useful in sterility. He quoted two cases in which the psychological causes were understood and could be explained to the patient and husband; in both of these cases pregnancy promptly occurred. Both patients had been married many years and were apparently sterile. Dr. McLelland mentioned the preparation "Serogan" and wondered whether it would be found to be useful, particularly in cases of anovular menstruation.

DR. BRUCE MAYES thanked Dr. Wilson for his excellent paper, given in scientific and critical fashion; it was very difficult to criticize one's own paper. Dr. Mayes used Rubin's test; it did not, of course, give the pictorial effect, but it achieved quite a lot and was not so expensive, as no radiography was necessary. Dr. Wilson had dealt very ably with total blockage as the main cause. The pelvic organs might appear perfectly normal and yet no pregnancy would result. This used to be considered a question of incompatibility between the man and the woman, but now one was forced to think of it as an endocrine imbalance, and success could sometimes be obtained with hormone therapy. When menstruation was perfectly normal and no pregnancy occurred, probably very few ova were actually freed from the ovary; it might be a case of anovular menstruation with only an occasional ovum freed from the ovary. It would be quite rational therapy to give the patient four to six injections of "Prolan" or "Antuitrin-S", the administration starting immediately after menstruation to stimulate the development of the Graafian follicle and liberate the ovum. It was very difficult to assess correctly the success of endocrine therapy in any case of sterility. The results were promising also in the treatment of patients who had a moderate degree of menorrhagia, probably metropathia. Here it was a question of whether sterility was really present or whether the endometrium was simply unable to retain the ovum. In this case one would give "Prolutan" (*corpus luteum*) five days before menstruation, and in young women under thirty years of age this would produce a diminution in the amount of loss. The injections should continue after pregnancy had occurred. The clinician was forced eventually to admit in cases of sterility that he must have a lot of trust in chance and time. There was a tremendous field for further investigation offered by the subject.

DR. NOEL M. GUTTERIDGE said that the only point at which his experience as a pathologist joined with Dr. Wilson's research study was with regard to the investigation of male sterility. Dr. Wilson had said that he preferred direct swabbing from the vagina and cervix in order to obtain spermatozoa. Dr. Gutteridge had had two failures to obtain spermatozoa by this method, due, it was considered, to the distance between the patient's home and the laboratory. The condom test held possibilities of a fallacy, in that there was some ingredient in the powder used for dusting the rubber which had a lethal effect on the spermatozoa. Dr. Gutteridge had used the external method of obtaining the specimen that was the recommended method in the department of urology at the New York Hospital. He evaluated the spermatozoa by staining them according to the technique of Cary and Hotchkiss, of that hospital.

DR. M. GRAHAM SUTTON said he was diffident about speaking on what appeared to be a purely gynæcological subject, but on reflection one had to realize it was really a genito-urinary one. However, he thanked Dr. Wilson for bringing up the subject of sterility again, and he was well aware of the time and trouble involved in such a presentation. Dr. Sutton had been interested in the matter for some years and had read a paper on Rubin's test some years before. He now used the lipiodol test too, but he combined the two methods. If the tubes were patent stethoscopic sounds were heard in the hypogastrium with Rubin's test, and also shoulder pain occurred. This was a referred pain from the irritation of the phrenic nerve endings due to the carbon dioxide gas floating up under the diaphragm when the patient assumed the sitting posture. If he was in doubt as to the patency of one or both tubes he used a ten cubic centimetre syringe on the end of his special cannula and injected lipiodol and took an X ray picture there and then without moving the patient.

It had struck him when Dr. Wilson was showing his slides of salpingograms that in those cases in which he was in doubt, if he had known how the gas was behaving he would have been able to make a positive assertion as to patency of the tubes. Dr. Sutton had found the combined method very helpful in diagnosis. He agreed with Dr. Gutteridge that it was very difficult to get a condom specimen with live sperms. But the sperms, though they might be dead, were usually normal in shape. However, a vesicular massage was often successful in yielding enough fluid to show live sperms in the expressed secretion. On the other hand, one might find pus and deformed sperms and then be able to give the husband advice.

Testicular puncture was another method, but the ejaculatory ducts might not be patent and one was no further ahead even if live sperms were found. Dr. Wilson had mentioned enlargement of the cervix, but had not stressed endocervicitis as a cause of sterility. While dilatation might assist cervicitis, Dr. Sutton felt that this was not the point and that endocervicitis should be treated or eradicated either by Sturmdorf's operation, diathermy or the more scientifically accurate cervical enucleation with Schlink's enucleator. Though it had been suggested that retroversion was not a cause of sterility, Dr. Sutton was inclined to believe otherwise and to consider that operations which replaced the uterus and thereby lifted the ovaries might help by assisting ovulation and the other functions of the ovary.

PROFESSOR SHEDDEN ADAM voiced his appreciation of Dr. Wilson's paper. His sphere, as professor of obstetrics, did not lead him into the question of sterility; but he had never been able to see why, when the cervix had been dilated, the uterus should be curetted. He also wished to mention the pH of the cervical secretion. He mentioned

the value of wheat germ oil, containing vitamin *E*, which seemed to have its place in embedding the ovum in the uterine wall, and of course helped to prevent early abortion.

DR. L. T. JOSKINS asked whether an interrupted pregnancy helped to develop the uterus.

Dr. Kenneth Wilson, in reply, thanked the speakers for their remarks. He had wanted also to find out whether the use of lipiodol was satisfactory and to compile his own statistics. It was not known why lipiodol was so successful. As regards dilatation and curettage, he thought that there was reason to suppose that they had a reflex effect on the pituitary body and therefore a secondary effect on the ovaries and uterus, and that was why a percentage of successes was obtained. Dr. McLelland had spoken of the infantile uterus and psychic effects; he was much more convinced than Dr. Wilson that the condition of hypoplasia occurred frequently. Dr. Wilson agreed that it did occur, but considered that its importance in sterility was a matter of opinion. Dr. Wilson thought that the factors that did change an infantile uterus into a normal uterus, and hypoplasia into non-hypoplasia, were marriage and intercourse, and naturally, therefore, he did not see many patients with infantile uteri; the uterus was mature when he examined the patient. He had not mentioned infantile uterus much, as he considered that the presence or absence of this condition was very difficult to assess. Dr. Mayes had spoken on rational endocrine therapy, and Dr. Wilson thought this was quite rational. With anterior pituitary hormone it was possible to cause follicular stimulation and growth, and perhaps produce an ovum. He agreed with the treatment of menorrhagia also; but the part that these played in sterility had not yet been assessed. With regard to Dr. Gutteridge's remarks on the investigation of the male, Dr. Wilson said that formerly he used to ask the patient to collect a specimen in a condom; but he found Hübner's test much more satisfactory. There was probably something in the rubber that killed the sperms. Dr. Sutton's combined test was a good idea. With regard to operations to enlarge the external os in cases of sterility, Dr. Wilson said that this operation had been performed and also that for removal of erosions, before the lipiodol examination. Dr. Wilson found that many patients had a retroverted pregnant uterus when they consulted him, and he therefore did not think that retroversion was a bar to pregnancy. In reply to Professor Shedden Adam, Dr. Wilson said that there was a school of thought that took into account the pH content of the vaginal secretion; but there was a mucus plug in the cervix and it was said that removal of this plug, with dilatation, had the effect of increasing the likelihood of pregnancy.

A MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on March 1, 1939, DR. F. L. DAVIES, the President, in the chair.

Diagnostic Methods in Gastric Diseases.

DR. J. ERSKINE SEWELL addressed the meeting on "Diagnostic Methods in Gastric Diseases". He showed a coloured motion picture of the technique of gastroscopy and a series of coloured lantern slides showing normal and pathological appearances of the stomach. Dr. Sewell first spoke of the various extragastric causes of dyspepsia, and with passing reference to the importance of the history and clinical examination in diagnosis, stressed the two facts that a typical symptomatology of any particular entity was rare and that very careful history-taking and clinical examination would frequently reveal an extragastric cause. Included among those conditions were: (i) pulmonary disease, particularly early tuberculosis; (ii) cardiac disease, either coronary disease or general circulatory failure; (iii) chronic infection of the gall-bladder, appendix or uterine adnexæ; (iv) syphilis; (v) uræmic states; (vi) pancreatic disease; (vii) endocrinal disturbances, such as toxic goitre and Addison's disease; (viii) deficiency conditions, such as pernicious anæmia, pellagra and sprue; (ix) toxic states, such as chronic carbon monoxide poisoning and lead poisoning; (x) functional nervous dyspepsia, which he characterized as a hazardous diagnosis, arrived at only after exclusion of all organic and reflex causes of dyspepsia.

Dr. Sewell then referred to the more direct methods of investigation of the state of the stomach itself. He said that a diagnosis of gastritis could be made with certainty nowadays. The two morphological methods of investigation were by means of radiology and gastroscopy respectively and in order of importance; the third method comprised the use of test meals of various types. Dr. Sewell strongly urged the absolute necessity for full investigation of any unexplained dyspepsia which persisted even slightly or intermittently for as long as three weeks. It was particularly culpable to omit full investigation when the patient was over thirty-five years of age; and it was only by early complete investigation that they could hope to lessen the terrible death roll from gastric carcinoma and the great amount of invalidism and suffering from the various types of gastritis which were still seldom recognized with certainty.

Speaking of radiology as indirect study of morphology, Dr. Sewell affirmed its established value. He commented on the limitations of gastroscopy and of radiology as limitations which rarely overlapped, and on the use of the two methods in conjunction to lessen errors in diagnosis. He added that there was no need to enlarge on the advances in the technique of work with barium meals, such as the important mucosal relief method. It remained, true nevertheless that apart from very gross hypertrophic forms the definite diagnosis of gastritis could not be made by radiological methods alone; the best results were obtained only when there was close cooperation between the radiologist and the gastroscopist.

With reference to fractional test meals, Dr. Sewell gave the details and limitations of the use of the Ewald and Boas meals and of a 7% solution of alcohol in water as a test meal. He referred to the value of histamine in distinguishing between true and apparent achlorhydria, adding that it should not be used when the systolic blood pressure was below 110 millimetres of mercury. Charcoal biscuit was used to test for retention of contents. Dr. Sewell also stated that if it was decided to give a test meal for diagnostic purposes he believed that the best choice was the alcohol test meal combined with histamine after the third specimen of gastric contents had been withdrawn. That type of meal was given with ease, took up less time and was less likely than others to cause suppression of the "psychic juices". Specimens were more easily withdrawn, the tube did not become blocked, and the samples were clearer for analysis. Lastly, the mild euphoria served to overcome the objections of the patient to what would otherwise be an unpleasant experience. The value of test meals in diagnosis was seriously impaired by the range of acid and chlorides encountered in healthy individuals; with the possible exception of investigation in cases of carcinoma of the stomach and of pernicious anæmia, analysis of the "resting" juices would usually be of as much assistance as the fractional test meals. However, when such a procedure as gastro-enterostomy was contemplated or when the efficacy of alkaline treatment was in question, gastric analysis could be very helpful.

Dr. Sewell emphasized the possibilities of gastroscopy, which he characterized as a simple routine method of investigation, devoid of discomfort and entirely without danger in expert hands; in some cases it was the sole method of arriving at a correct diagnosis. Because of optical and anatomical difficulties and difficulties of illumination, all extending over some seventy years, the history of gastroscopy was a sad one until the Wolf Schlindler flexible gastroscope was introduced in 1932. Dr. Sewell demonstrated from lantern slides the points of interest in the gastroscopes of Mikulicz (1881), Sussmann (1911) and Wolf Schlindler. He stated that the contraindications to the use of the modern flexible

instrument were few in number and were readily recognized. Those to which he referred were the following: (i) aneurysm of the aorta, excluding some aneurysms of the ascending aorta; (ii) cirrhosis of the liver associated with varices of the œsophagus; (iii) œsophageal or cardiac obstruction; (iv) corrosive gastritis, on account of the danger of perforation; (v) abdominal rigidity, which might add to the risk of perforation should retching or distension occur; (vi) gross kyphosis or scoliosis leading to insuperable anatomical difficulties; (vii) *angina pectoris* and cardiac decompensation, which were only relative contra-indications requiring the judgement of the gastroscopist.

The indications for gastroscopy were then outlined by Dr. Sewell. He said that gastric ulcer was a definite indication, because in the first place the differentiation between benign and malignant ulceration by gastroscopy was as a rule easy, in contrast with the admitted difficulty of radiology. Moreover, the healing process could be followed with precision. Quite a large ulcer might be seen through the gastroscope, although it was symptomless, and examinations of the fæces for occult blood were repeatedly without result. In gastric carcinoma, by means of gastroscopy the diagnosis could be confirmed, the operability determined, and the degree of accompanying gastritis assessed. In duodenal ulcer, particularly if an operation was contemplated, gastric ulcer or gastritis or both might be found by gastroscopy to be associated with the duodenal ulcer. Gastroscopy was valuable in suspected syphilitic ulceration when syphilis led to gastro-intestinal symptoms. Hæmatemesis or melena might be shown by gastroscopy to be caused by severe ulcerative hæmorrhagic gastritis, hæmorrhagic erosion or benign tumour. Unexplained failure of appetite and loss of weight might be proved suitably early to be due to carcinoma, so that successful operative treatment could be undertaken. Confirmation of the diagnosis of pernicious anæmia and the observation of the recovery from the accompanying atrophic gastritis following the use of liver in treatment might be made by gastroscopy. Gastroscopy might be used in post-operative recurrence of dyspepsia, gastritis or peristomal ulceration; it was indicated in conditions classed as functional, which might in reality be some severe type of gastritis.

Dr. Sewell then discussed the limitations of gastroscopy. He stated that there were definite blind areas, which varied from case to case. It was essential that the gastroscopist should know which areas he had not seen at an examination; the two constant blind spots fortunately were relatively unimportant because of the rarity of lesions in those areas. Dr. Sewell illustrated the sites of the constant blind spots diagrammatically and then showed a coloured motion picture of an actual gastroscopic examination. He pointed out that it was frequently possible to visualize the appearances in the stomach more clearly than it was possible to demonstrate them by means of lantern slides. The slides were prepared carefully from exact sketches made during observations, confirmed by several observers, coloured by an artist and photographed onto coloured plates. Dr. Sewell showed five such slides of the normal stomach and then demonstrated from a large number of slides the appearances of abnormal conditions. He remarked that by means of the gastroscope it was often possible to determine the operability of the lesion and also the degree of associated gastritis, which was of great importance from the point of view of the surgeon. Nobody should expect the incisions to heal satisfactorily in a grossly inflamed stomach. By thorough and careful pre-operative preparation the associated gastritis could usually be ameliorated considerably. Dr. Sewell added that a radiologist was frequently able to diagnose the presence of a benign tumour, but that that diagnosis was very much more easily made gastroscopically. He pointed out on certain lantern slides the difference between the pale pink tinge of simple anæmia and the greyish-green coloration of atrophic gastritis.

In conclusion, Dr. Sewell said that he had no desire to contrast the values of radiological and gastroscopical methods, which were supplementary to each other; both were essential in a complete investigation. He had submitted himself twice to gastroscopy in 1937, in order to know the subjective feelings of the patient; a different technique had been used on each occasion. The only discomfort had been experienced when he dined some hours later and found that there was some slight interference with the normal comfort of swallowing. Dr. Sewell remarked that he had a full set of teeth, a rather stiff short neck, and a clammy skin indicative of nervousness; those three features made him a comparatively difficult subject for gastroscopic examination.

DR. JOHN HORAN thanked Dr. Sewell for his excellent demonstration of the technique in gastroscopy and congratulated him on the practical manner in which he had presented his subject. Dr. Horan asked Dr. Sewell whether he examined the patient's chest by means of fluoroscopy and gave him a "barium swallow" before making the gastroscopic examination. He said that the instrument had to be passed rather quickly through the œsophagus during its introduction, so as to avoid any hold-up from spasm at the cardia, and that for this reason he considered a "barium swallow" essential as a preliminary to gastroscopy.

Dr. Horan said that Dr. Sewell's restraint in dealing with the claims of the gastroscope was to be commended, for the gastroscope was not like the cystoscope, which could be moved in all planes and brought close to lesions on the bladder wall. The gastroscope after its introduction occupied a relatively fixed position to the left of the spine, and it was because of its long depth of focus that the distant pylorus and pyloric antrum were seen in the stomach, which was distended with air. He said that Dr. Sewell had emphasized the difficulty in seeing lesions situated on the lesser curvature of the pyloric antrum, and that he had indicated how the difficulty in observing lesions situated on the posterior wall had to some extent been overcome by the use of the rubber balloon. This was fitted just proximal to the objective of the instrument and was inflated after the instrument had been introduced. None the less, that part of the posterior wall immediately below the cardia could not be seen even with the balloon attachment, for when the objective of the instrument was brought level with this part of the posterior wall the balloon was in the lower end of the œsophagus. Dr. Horan pointed out that it was because of these "blind spots" that a diagnosis of "no ulcer present" might not be made with the gastroscope.

Dr. Horan then went on to discuss the clinical aspect of the various forms of gastritis. He said that chronic superficial gastritis was usually seen in association with gastric ulcer, gastric carcinoma, or sometimes in the gastric mucosa surrounding a gastro-enterostomy stoma. Apart from such organic lesions chronic superficial gastritis was not frequently encountered in gastroscopic examination. He said that in the presence of this disorder the patient usually complained of epigastric discomfort, which was made worse by food. The pain was not periodic, but was continually present. The most important sign was tenderness over the body of the stomach, which was usually to the left of the umbilicus. It was thought that in some of these cases the lesion progressed to chronic atrophic gastritis. In chronic atrophic gastritis the patient complained of epigastric distension, the frequent belching of wind, irritability, nervousness and abnormal fatigue. Although the tongue might be smooth, even in the absence of blood changes, physical examination usually revealed no abnormality. Dr. Horan said that atrophy of the gastric mucosa was found in all cases of pernicious anæmia and that this atrophy was most often encountered in the upper parts of the body of the stomach and not in the pyloric antrum as might be expected. He had observed several patients, with pernicious anæmia, treated with liver whose atrophic gastric mucosa had regenerated; subsequent polyposis of the stomach had developed.

Dr. Horan said that the patient with chronic hypertrophic gastritis suffered from attacks of pain which were periodic in character. These attacks were frequently precipitated by indiscretions in diet. The pain was situated in the epigastrium and was severe in nature and aggravated by food. An occasional hæmatemesis occurred. Unlike super-

ficial gastritis, the hypertrophic variety never cleared up completely.

Dr. Horan said that in the investigation of those cases of dyspepsia arising after gastro-enterostomy the combined use of radiology and gastroscopy was essential, as the gastroscope had shown that a gastritis not revealed by X ray examination might account for the symptoms which developed after operation. He said that the gastroscope, however, because of its relatively fixed position, would reveal only that part of the jejunum which was situated opposite the stoma, in line with the objective of the instrument, and that in some cases the view was confined entirely to the gastric aspect of the anastomosis, as the stoma remained closed throughout the procedure.

DR. IAN WOOD expressed his thanks to Dr. Sewell for the very informative address he had given, and commented on Dr. Horan's generosity as a teacher of the technique and interpretation of gastroscopy. Dr. Wood referred to the signs and symptoms of a male patient, aged fifty years, with malignant disease of the stomach; he had been submitted to gastroscopic examination to determine whether the condition was operable. The patient was extremely debilitated and had a gross iron-deficiency anæmia with macrocytosis; he had lost much weight and hydrochloric acid was absent from the stomach contents. The condition of the patient had been brought on by vomiting and anorexia associated with chronic epigastric pain. The gastroscopic examination was part of the investigation, and the result of the examination was a link in the chain of evidence. The pain became intense and the patient suicidal, but the operation gave him a considerable measure of relief. In another instance to which Dr. Wood referred it was thought that a patient had an ulcer, possibly malignant, high up in the lesser curvature. As a result of the use of the gastroscope a second lesion was found, the presence of which had not been indicated by radiography. Dr. Wood summed up by stating that none of the investigations could be dispensed with, and that radiographic methods were of prime importance; but that by means of the gastroscope a sound opinion could be expressed as to whether an ulcer was healing or had healed.

DR. JOHN O'SULLIVAN said that he had been interested in the question of gastroscopy. Fourteen years earlier he had seen a gastroscope of the rigid type forced down a patient's throat, though the modern flexible one could be swallowed with ease. The routine employment of the gastroscopic method would have a valuable corrective and correlating effect on the results of radiographic investigation; at times it would provide reliable confirmation of negative findings, so avoiding laparotomy based on the external appearances of the stomach. It would also enable earlier diagnosis of gastric carcinoma to be made, perhaps in the precancerous stage or even in the stage of epithelial irritation. Dr. O'Sullivan then showed a series of lantern slides illustrative of the compression technique, the mucosal technique and the peristaltic films obtainable radiographically.

DR. IVAN MAXWELL commented that the examination of the interior of the stomach must be the most sensible of all methods and that more and more accurate information could be expected by that means as time went by. He was more concerned with the biochemical side of the investigation than he was with the clinical aspect, as it presented itself to the general practitioner; but there was an important preventive measure to which he would like to draw attention. It had been established that 10% of unselected young people had more gastric acidity than was good for them, and Ryle had stated that those with high acidity early in life were the candidates for ulcer later in life. On that basis Dr. Maxwell estimated that about 50,000 people in Melbourne with hyperacidity would be consulting general practitioners. If those persons were investigated by means of a simple test meal carried out by the medical practitioners as medical students were taught to do it, it would be established that they belonged to the "high acidity" group. They could be advised to take alkali at bed time and to be careful about their dietary, and it could be expected confidently that those steps would be important preventive measures against ulcer formation. Dr. Maxwell added that the taking of alcohol before a meal by a member of the high-acid group resulted in the raising of the acidity to a very high figure, which was harmful. He also stated that 10% to 15% of persons belonged to the "low acid" group and should not be allowed to go to civil appointments in the east, as they were specially subject to infections. Of the 50,000 with hyperacidity probably not more than one-fifth would be likely to give suspicious radiographic evidences, though the biochemical investigations would place all of them as candidates for peptic ulcer.

DR. CHARLES OSBORN added a point on the prevention and early diagnosis of gastric neoplasms. He referred to the test for occult blood in the stools. The technique of the test was simple, and it could be done by general practitioners. It was a simple method of confirming the presence of a break in the mucous membrane; provided that the conditions of the test were observed, no occult blood would be present before there was a break in the mucous membrane. Dr. Osborn added that from subjective experience he could concur with Dr. Sewell's view that the passage of the gastroscope was not very unpleasant for the patient. With reference to premedication, a point worth noting was that the giving of a hypodermic injection of 0·02 gramme (one-third of a grain) of "Omnopon" and 0·5 milligramme ($^1/_{120}$ grain) of "Scopolamine" overcame nervousness without interfering with the patient's power of cooperation, though it might diminish peristaltic activity. Dr. Osborn also referred to anæsthesia and the supposed accidents with the use of a 2% solution of "Decicain". Schindler had stated that there were no recorded fatalities. A good antidote was "Evipan". Dr. Osborn, in conclusion, remarked that though the elaborate table described by Dr. Sewell would be very helpful, it was not indispensable. Gastroscopy was even a more simple procedure than Dr. Sewell had led them to believe, and could be carried out satisfactorily on an ordinary modern tilting operation table.

DR. LEO DOYLE questioned the safety of "Pantocain", stating that Dr. Mollison had said that it was a very dangerous drug.

DR. KEITH H. HALLAM considered that if the radiologists and gastroscopists combined their efforts they would be of greater assistance to clinicians in the investigation of gastric disorders. In that field he as a radiologist was becoming more and more humble with the passage of time. He did not hesitate to say that there were still a great many things in the stomach which were obscure to radiologists.

Dr. Sewell, in reply, thanked those who had contributed to the discussion. He said that he had not found it necessary to use premedication as a routine procedure, but on occasions when the patient was very restless he had found it of assistance. He was not in agreement with Dr. Osborn concerning the helpfulness of the test for occult blood in the fæces; there were many fallacies which were at times very difficult to exclude. Moreover, repeated negative findings were not at all uncommon, in spite of the presence of active gastric ulceration. Further, he would not expect a positive result to the test in early carcinoma of the stomach. He added, however, that as a link in the chain of evidence the occult blood test was helpful, but not to the extent that might be inferred from Dr. Osborn's statement that night. Dr. Sewell agreed heartily with what Dr. O'Sullivan and Dr. Hallam had said about the value in diagnosis of the close cooperation between radiologists and gastroscopists.

A MEETING of the Victorian Branch of the British Medical Association was held on April 19, 1939, at the Women's Hospital, Carlton. The meeting took the form of a number of clinical demonstrations by members of the honorary staff.

Achondroplasia.

DR. COLIN MACDONALD showed four patients of short stature, whose heights ranged from 100 to 132·5 centimetres (40 to 53 inches) and who were aged from twenty-three to twenty-eight years. These had been investigated radiologically, with special reference to the pelvic diameters. The method of pelvic mensuration used by Dr. Macdonald was that which he had seen at the Yale Medical School, where Professor Hervert Thoms was in charge of the department of obstetrics. It was both simpler and more accurate than other procedures. Three of the patients had been the subjects of elective Cæsarean section, all the babies having lived; and the fourth, who was the shortest, being only 100 centimetres (40 inches) in height, was now four and a half months pregnant.

One of the patients, whose height was 117·5 centimetres (three feet eleven inches), was a typical achondroplasic. Internal pelvimetry showed that her *conjugata vera* was contracted to 4·8 centimetres (1·9 inches), the average normal measurement for this diameter being 10·5 centimetres (4·2 inches).

The shortest patient presented most of the clinical features of achondroplasia, but the radiological appearances of the pelvis and hip joints were more akin to those of Morquio's disease, a generalized osteochondral dystrophy, first described in 1929 and now a well-recognized entity. The patient in question did not, however, show the platyspondylia characteristic of Morquio's disease.

The condition of the third patient, whose height was 130 centimetres (52 inches), was regarded by Dr. Macdonald as abortive achondroplasia. The last patient, 132·5 centimetres (53 inches) in height, was dwarfed by Pott's disease.

Dr. Macdonald described the dwarfs of history and of legend. He said that representations of achondroplasic Egyptian gods were to be seen in the British Museum, but achondroplasics formed only a percentage of all dwarfs. John Jarvis, the dwarf of Queen Mary of England, was said to be only 60·0 centimetres (two feet) high; he was obviously not an achondroplasic, for the recorded height of the shortest proven achondroplasic was 95 centimetres (38 inches). Similarly, "General" Tom Thumb, who was exhibited in London during the middle of the nineteenth century, was probably not an achondroplasic, for his height was 77·5 centimetres (31 inches). A very tiny fellow was Jeffrey Hudson, who was introduced to Charles I and his queen in a pie brought to the dinner table; at nine years of age he was only 45 centimetres (eighteen inches) in height.

Dr. Macdonald went on to say that folk tales of most countries included accounts of diminutive people, usually with superhuman qualities; and the fairies of childhood enjoyment were believed to be little people probably for no other reason than to explain the difficulty of seeing them. The dwarfs of Teutonic legend—for example, Mime and Alberich, the Nibelungs in Wagner's "*Das Rheingold*"—were of grotesque appearance, often malicious and of marvellous cunning in the working of metals. The true achondroplasics were of lively intelligence and of affectionate disposition, which accounted for the popularity and esteem in which they were held during the seventeenth and eighteenth centuries as jesters and attendants in the courts of European monarchs.

Dr. Macdonald then described the clinical and radiological features in the differential diagnosis of achondroplasia from other forms of dwarfism. In 1860 Muller recognized achondroplasia as distinct from rickets, and in 1878 Parrot bestowed on it its present name. In 1892 Kaufmann studied its pathology minutely and termed it *osteochondrodystrophia fœtalis*. It was Pierre Marie who described the hand as "*main en trident*". Though three generations of achondroplasics had once been recorded, attempts by Catherine de Medici, by Natalie (sister of Peter the Great) and by the Empress Anne of Russia to raise a race of dwarfs had met with no success; a familial ætiology was absent, and in this respect achondroplasia differed from Morquio's disease.

Urological Skiagrams.

DR. HAROLD MOORE showed some X ray films of urological interest. The first were of a patient who had suffered from an inversion of the uterus following labour. Before the uterus was replaced the whole of the mucous membrane of the bladder had sloughed. The patient had been left with a very small fibrotic bladder, with almost constant dribbling of urine. Transplantation of the ureters was considered as the best way of solving her problem; but films taken after the injection of "Uroselectan B" showed that both ureters were tremendously dilated. The operation was thus impossible.

In contrast with these skiagrams was a series from a case in which a transplantation into the sigmoid colon had been carried out for intractable cystitis. Three sets of films were shown, one taken before operation and the others taken one and two years after operation. The patient had been very well and comfortable since operation. No abnormality was shown in the first films, but in the other two series some dilatation of the ureters and pelvis was to be seen.

Another film taken after injection of "Uroselectan B" revealed a perfectly normal right pelvis and ureter, but practically no secretion of dye on the left side. This was the result of a tuberculous infection of the left kidney. The patient had been under observation for some months, it being considered that she was suffering from cystitis. The true diagnosis had been suggested by cystoscopic examination and confirmed by the examination of a twenty-four hour specimen of urine. A profuse growth of tubercle bacilli had been obtained by culture. Dr. Moore said that this case illustrated the value of culture methods in establishing the diagnosis. Examination of direct smears from the twenty-four hour specimen of urine had been without result; but within three weeks culture had resulted in a profuse growth of tubercle bacilli of the human type. The method represented a great saving of time compared with that of guinea-pig inoculation and was also more reliable.

Dr. Moore then showed another film from a patient who had suffered from pain in the right loin for two years. A pyelogram revealed a high bifurcation of the ureter with slight dilatation of the lower pelvis, but the film also revealed sacralization of the fifth lumbar vertebra on the right side. The question was which lesion caused the patient's pain. As she had few urinary symptoms, and as distension of the renal pelvis with sodium iodide when the pyelogram was being made did not reproduce her pain, it was thought that the pain was not renal in origin. She was still under observation at the time of the meeting.

Finally Dr. Moore showed a film of a patient who had suffered from left-sided pain for two years and who had also passed gravel on several occasions. X ray examination revealed numerous small shadows in the left kidney; but except for the culture of *Staphylococcus albus* from her urine all other investigations were without result. It was thought that the staphylococci were not contaminants but the primary cause of her trouble. She had been given a course of "Proseptasine" and was receiving renal lavage with relief of symptoms.

(To be continued.)

Medical Practice.

ADDICTION TO MORPHINE AND HEROIN.

THE Secretary of the Police Department, Sydney, has forwarded, with a request for its publication, a copy of an extract from a memorandum, issued by the Home Office, London, on the precautions to be observed in the administration of morphine and heroin. In view of the provisions of the New South Wales *Police Offences Amendment*

(*Drugs*) *Act* and regulations it is hoped that this extract will be of assistance to members of the medical profession. The extract is as follows.

50. The position of a practitioner when using morphine or heroin in the treatment of persons who suffer from addiction to either of these drugs obviously differs in several important respects from that in which he is placed when using the drugs in the ordinary course of his medical practice for the treatment of persons not so affected. Not only will the objects of treatment usually differ, but also the dangers to be avoided and the precautions that are therefore necessary. It is thus convenient to discuss these precautions separately as regards: (i) the administration of the drugs to persons who are already victims of addiction, and (ii) the ordinary use of the drugs in medical and surgical practice.

Precautions in the Treatment of Addicts.

51. In the preceding section the conclusion has been stated that morphine or heroin may properly be administered to addicts in the following circumstances, namely, (*a*) where patients are under treatment by the gradual withdrawal method with a view to cure, (*b*) where it has been demonstrated, after a prolonged attempt at cure, that the use of the drug cannot be safely discontinued entirely, on account of the severity of the withdrawal symptoms produced, (*c*) where it has been similarly demonstrated that the patient, while capable of leading a useful and relatively normal life when a certain minimum dose is regularly administered, becomes incapable of this when the drug is entirely discontinued.

Precautions in the Treatment of Addicts by the Gradual Withdrawal Method.

52. In these cases the primary object of the treatment is the cure of the addiction, if practicable. The best hope of cure being afforded by treatment in a suitable institution or nursing home, the patient should, if possible, be induced to enter such an institution or home. If he is unable, or refuses to adopt this course, the practitioner must attempt to cure his condition by steady, judicious reduction of the dose. The general lines of the treatment, as carried out by practitioners of special experience, have already been described. For success it is necessary that the patient should be seen frequently, be under sufficient control and be in the care of a capable and reliable nurse. The practitioner should endeavour to gain his patient's confidence and to induce him to adhere strictly to the course of treatment prescribed, especially as regards the amount of the drug of addiction which is taken. This last condition is particularly difficult to secure, as such patients are essentially unreliable and will not infrequently endeavour to obtain supplementary supplies of the drug. If, however, the practitioner finds that he cannot maintain the necessary control of the patient, he must consider whether he can properly continue indefinitely to bear the sole responsibility for the treatment.

53. When the practitioner finds that he has lost control of the patient, or when the course of the case forces him to doubt whether the administration of the drug can, in the best interests of the patient, be completely discontinued, it will become necessary to consider whether he ought to remain in charge of the case and accept the responsibility of supplying or ordering indefinitely the drug of addiction in the minimum doses which seem necessary. The responsibility of making such a decision is obviously onerous, and both on this ground and also for his own protection, in view of the possible inquiries by the Home Office which such continuous administration may occasion, the practitioner will be well advised to obtain a second opinion on the case.

Precautions in Treatment of Apparently Incurable Cases.

54. These will include both the cases in which the severity of withdrawal symptoms, observed on complete discontinuance after prolonged attempted cure, and the cases in which the inability of the patient to lead, without a minimum dose, a relatively normal life appear to justify continuous administration of the drug indefinitely. They may be either cases of persons whom the practitioner has already treated with a view to cure, or cases as to whom he is satisfied by information received from those by whom they have been previously treated, that they must be regarded as incurable. In all such cases the main object must be to keep the supply of the drug within the limits of what is strictly necessary. The practitioner must, therefore, see the patient sufficiently often to maintain such observation of his condition as is necessary for justifying the treatment. The opinion expressed by witnesses was to the effect that such patients should ordinarily be seen not less frequently than once a week. The amount of the drug supplied or ordered on one occasion should not be more than is sufficient to last until the next time the patient is to be seen. A larger supply would only be justified in exceptional cases, for example on a sea voyage, when the patient was going away in circumstances in which he would not be able to obtain medical advice. In all other cases he would be advised to place himself under the care of another practitioner, who should be placed in communication with his previous medical adviser in order that he might be informed as to the nature of the case and the course of treatment which was being pursued.

55. A practitioner when consulted by a patient not previously under his care, who asks that morphine or heroin may be administered or ordered for him for the relief of pain or other symptoms alleged to be urgent, should not supply or order the drug unless satisfied as to the urgency, and should not administer or order more than is immediately necessary. If further administration is desired, in a case in which there is no organic disease justifying such administration, the request should not be acceded to until after the practitioner has obtained from the previous medical attendant an account of the nature of the case. Requests from one practitioner to another for such information should obviously receive immediate attention.

Precautions in the Use of Drugs in Ordinary Medical Practice.

56. The evidence we have heard would appear to indicate that there has been a recent diminution in the prevalence of morphine addiction and that this is due to the operation of the *Drugs Act* in making it difficult to obtain the drugs except from or on the prescriptions of doctors. This enhances the importance of consideration of precautions that are necessary in the use of these drugs in ordinary treatment, in order to reduce to a minimum the risk that a patient may develop a craving for them. The precautions are fairly well recognized among competent and careful practitioners in all branches of the profession, and the conclusions here stated, based on the testimony of our medical witnesses, including representative general practitioners, may be regarded as expressing fairly the opinion of all members of the profession who have given the requisite attention to the subject.

57. Where the patient is suffering from organic disease for the treatment of which the drugs are necessary, the matter may be considered under two aspects, (*a*) cases in which the administration of morphine or heroin may be necessary for an indefinite period and in which the probability of a cure of the disease is remote (for example, inoperable cancer and the like), (*b*) cases in which administration of the drugs is called for in order to deal with conditions which, though due to organic disease, may be expected to be of a more or less temporary duration (such as renal or biliary colic *et cetera*). In regard to class (*a*), since consideration of the possibility of the establishment of a craving cannot be allowed to influence the administration of such doses of the drugs as are considered necessary for the adequate treatment of the organic disease, it will be in those rare cases only in which there is some prospect of partial or complete recovery from the disease that any attention can properly be given during the course of treatment to such measures as are likely to mitigate or avert the risk of subsequent

persistence of any craving which may have been produced. In respect of class (b) the employment of these measures becomes of paramount importance. They are identical with those discussed in paragraphs 59 and 60, and consist mainly in the substitution, when possible, of other drugs for morphine and heroin, in close supervision by the practitioner of the amounts used and of the frequency with which they are administered, and in withdrawal of the drug as soon as the necessity for its administration has ceased.

58. In stating the precautions which we think should be observed in cases other than those referred to in the preceding paragraph, we shall be understood to have in mind, particularly, in those cases in which it is thought necessary to administer, say, morphine, in such doses, with such frequency and for so long a period as may be requisite, for example, for the relief of pain after surgical operations, or in cases of severe neuralgia in which the necessary relief cannot be obtained otherwise.

59. In cases in which it appears that the use of morphine or heroin may be thus desirable, it must be first considered whether the purpose of treatment can be substantially as well served by other drugs which do not involve the risk of addiction. Constant attention is necessary to adjust the dosage to the varying needs of the case. The intervals at which it is desirable to see a patient (not an addict) who requires the administration of morphine or heroin will necessarily be determined by the nature of the case. In cases of chronic disease requiring a more or less long administration of the drugs, the patient need only be seen at such intervals as are appropriate on other medical grounds; but in cases such as renal or biliary colic, in which the necessity for the administration may cease at any moment, it may be important to see the patient more often than would be otherwise necessary in order to guard against the production of a craving.

The quantity supplied or ordered at one time for use by those nursing the patient should not ordinarily exceed what will be required before the patient is seen again. Where any discretion is given to nurses as to administration it should be strictly limited by prescription and any change made in the treatment should similarly be stated in writing. The practitioner will realize that the responsibility for administration is entirely his, and cannot be properly delegated to any person not medically qualified. It is desirable also that the patient should not be informed of the name of the sedative drug employed; particularly inexpedient is the handing over to the patient of original packages containing morphine tablets, or the like, which bear on their labels a clear statement of the exact amount contained in each tablet. Hypodermic administration of the drug by the patient to himself is to be strongly deprecated.

60. The use of the drug should be discontinued as soon as possible, and if unfortunately a craving has formed, close supervision and appropriate treatment must be maintained until the medical attendant is satisfied that the patient has been rendered independent of the drug. It is to be noted in this connexion that, in the opinion of some authorities, a month's continuous administration of morphine may suffice to produce in a person who previously appeared normal a condition of addiction (as shown by withdrawal symptoms observed on discontinuance); and in persons with an inherent predisposition administration for a shorter period may have this effect.

Correspondence.

INDIAN FIRE-WALKING.

SIR: Fire-walking, thanks to a comparatively recent visit to England of a well-known Indian exponent of the art, is now quite widely known as an Eastern practice. The underlying physiology, that is, why the walker does not get his feet burnt, is, however, as obscure as ever. As I have recently been lucky enough to witness a fire-walking performance, the following account may be of interest. I describe it exactly as it happened.

In India, fire-walking seems to be a Mohammedan specialty, and this particular ceremony occurred in Secunderabad, Deccan, early in March this year, during *Maharrum*, the great Mohammedan mourning festival, which celebrates the demise by poisoning of one Hussain, a grandson of the Prophet. To the Mussulman it corresponds rather to our Good Friday.

The fire-walker in this case was a sweeper (this is at the very bottom of India's elaborate social scale, the lowest of the low) in the Indian Hospital Corps, and he gave his performance in the followers' lines at the Indian Military Hospital, Secunderabad. This Hyderabaddi Mohammedan had for some years past performed the ceremony every *Maharrum*, devoting nearly the whole of his year's very meagre pay to the night's entertainment. The evening's performance, with the fire, illuminations, musicians and sundry expenses, cost him about £12—a lot of money to an Indian sweeper. But the earthly lot of a sweeper is scarcely a happy one, and this made him a certainty for an honoured position in Paradise.

The fire pit was about ten by five feet with a depth of about a foot. Several hours before some tons of firewood were burnt in it, so that by the time of the "walking", about 10 p.m., it was full of bright red embers, so hot that it was uncomfortable to come within eight feet of it. Periodically, and immediately before the "walking" began, a man turned it over with a long wooden pole, which caught fire in the process, to even it out and remove the ash forming on the top.

Close to the pit a small pavilion, highly decorated with the coloured paper and tinsel beloved by India, had been temporarily erected. It contained an extremely holy relic, which I understand was a representation of a hand-print of the martyred Hussain. How it got there and became so holy was rather too technical for my *Urdu* to elucidate; it does not do to pursue these topics too far. There were a large crowd of spectators and a (very) Indian band. So much for the setting.

Now with much beating of drums and other sounds peculiar to Indian musicians, the "walker" appeared, surrounded by admirers, from behind some sheds, where he had been having a ceremonial bath under a tap. This bath, I gathered, was of great importance. To omit it was to court burnt feet. He was accompanied by a friend, also to fire-walk, and both were dressed in trunks and vest. Both men seemed to be in a state of profound emotional distress, as though they were going to their doom, and had to be dragged forward by the cheering crowd who surrounded them. Both looked on the point of collapse, one with legs and arms rigidly extended, having to be practically carried forwards. All this, an Indian officer explained to me, was their intense reluctance to approach the very sacred symbol. The onlookers, who seemed to share none of this reluctance, eventually got the two men into the pavilion, whence in due course they emerged, carrying each a *Sazia*, which is a cardboard representation, suitably decorated and carried on a pole, of the deceased Hussain's tomb in (I think) Mecca. These they carried in front of them for the rest of the performance.

The fire-walker and his companion then approached the pit, freshly raked to a bright glowing redness, and at this stage had water poured over their feet. This made a good deal of mud at one end of the fire pit, so that the initial run at any rate was made with wet feet. But first they jogged slowly round the pit several times, then suddenly the principal performer ran straight across the pit from end to end, his companion following. Each crossed back again, and this was repeated several times. I must say I was rather disappointed here, as I had expected to see him walk slowly across and not take it at a run. However, it took about eight steps to cross, so that each foot sank into the embers to a depth of three to four inches, about four times each crossing. Both fire-walkers were still under considerable and obvious emotional stress and seemed to be acting more or less mechanically.

But now followed the most interesting part of the evening. A general invitation was now given to the

onlookers to join in the fun, and at least a couple of dozen, including nearly all the small boys present, scampered barefooted across the fire pit, not just once, but several times. They all did it at a run, taking about six to eight steps to cross; but one old man, a bit stiff in the joints, took at least a dozen steps to cross. He was unburnt. One youngster, aged about five, tripped in the middle and nearly fell headlong, but apart from this there were no casualties. I was invited to try it, but as my interest in personal experimental physiology lies in directions other than fire-walking, I declined. I doubt if my wife, also present, would have approved. I felt convinced, however, that had I, or for that matter anyone else, run across in the same way as the others I would not have been burnt.

I examined numerous feet both before and after, including those of the principal fire-walkers, but they appeared absolutely normal in every respect. I found only normal soles, neither red nor tender, nor was there any evidence of superficial singeing. A brother officer in the Indian Medical Service confirmed this. Most of them were highly amused that I expected to find anything wrong. And they were all back at work as usual next day. There were no burns for treatment. I carefully checked this.

The physical and physiological explanation of the fire-walking (in this case better "fire-running") phenomenon has suggested that a layer of ash protects the feet, an explanation which can be excluded, because in this case the embers were raked red immediately before and were thoroughly churned up by the numbers running through. Then there is the possibility that a layer of steam between foot and the embers acts as a blanket. The original run was made with wet feet, so that this may have been a factor. However, the wet earth was only at one end of the pit and by the time the spectators had finished running across it was practically dry. There was no evidence of excessive sweating in any of the feet I examined. Steam may have a protective role, but I doubt if this plays more than a very minor part.

Admittedly the bare-footed Indian has a very much thicker sole than the shoe-wearing European, and this no doubt is an important point. However, some of the children were very young and quite thin-soled. It was apparently not even painful, for, although the two principals had worked themselves into a state of religious emotional exaltation beyond all feeling of pain, this certainly did not apply to the numerous small boys who scampered through, obviously having the time of their lives.

There was nothing mystical about this particular fire-walking display. A lot of people ran through a bed of red-hot embers and none was burnt, and apparently it must be accepted as a physiological fact that if, given moderately thick soles, one runs barefooted for a short distance across red-hot coals, one does not get burnt provided one is quick about it and does not hesitate in the slightest. It is apparently similar to the practice of tossing back with the fingers embers which have fallen from a fire—it is all right if you are quick about it.

Perhaps one day I will see a fire-walker walk very slowly through, then I will have to find a better explanation.

Yours, etc.,

A. J. CLYNE,

Captain, Royal Army Medical Corps.

Srinagar,
Kashmir,
May 4, 1939.

THE FIRST USE OF RADIUM NEEDLES IN AUSTRALIA.

SIR: I should be glad if you would allow me space in your journal to draw attention to an inaccurate statement appearing in Dr. Moran's book "Viewless Winds".

On pages 258-259 he states that he went to the United States late in 1922 and bought his first 100 milligrammes of radium; and on page 261 he says he "was the first medical practitioner in Australia to use radium needles or radium tubes in the treatment of cancer. Prior to this, of course, small radium plaques or plates had been in use for the cure of tiny superficial skin lesions. These were very lightly screened and delivered no effective depth dose."

I would like to state that on February 17, 1911, twenty-one pieces of radium, consisting of twenty plates of various strengths and one fifty-milligramme tube, were purchased by Dr. Langloh Johnston for the Sydney Hospital, in all a total of 252·5 milligrammes.

This radium was first used on May 5, 1911, and from this date onwards was used continuously in the treatment of all grades of skin carcinomata, and the tube was used for carcinoma of the female genital tract, breast cases and glands, as well as many other types of lesions, superficial and deep.

In the eight months of 1911, 163 new cases alone were treated at the clinic, and between 1912 and 1922 the annual total of new cases treated varied between 180 and 250.

This antedates Dr. Moran's first use of radium tubes by at least eleven years.

Yours, etc.,

SYLVIA D. BRAY,

Radium Registrar, Sydney Hospital.

Sydney Hospital,
May 18, 1939.

TRANSPOSITION OF THE VISCERA.

SIR: Dr. Rosenthal's article in your issue of May 20, page 761, recalls a case which may interest him.

About forty years ago I was allowed the honour of assisting Dr. G. E. Rennie at a *post mortem* dissection and demonstration of a woman said to have died of pulmonary tuberculosis. There was so much adhesive pleurisy, ulceration and fibrosis of each lung that we could not distinguish the lobes, but with this possible exception all the viscera and large vessels were transposed. Not only was there dexiocardia with left-sided gall-bladder and large hepatic lobe and caecum and *appendix caeci*, and right-sided stomach and spleen, but also mirror image of the vessels at root of neck.

Three more minor items: none of us had any gloves; Dr. George Rennie wore, as usual, his tall silk hat for the whole hour or so; the remark that the only failure in the completeness of transposition was that the subject wore her wedding ring on her left hand drew a faint laugh from Dr. Rennie, so habitually solemn.

Yours, etc.,

GUY GRIFFITHS.

Sydney,
May 22, 1939.

The Royal Australasian College of Physicians.

EXAMINATION FOR MEMBERSHIP.

THE next examination for membership of the Royal Australasian College of Physicians will be held in Sydney in August and September, 1939. The written paper will be taken in capital cities where candidates are offering on Saturday, August 19, and the clinical examination will be conducted in Sydney on Wednesday and Thursday, September 6 and 7.

Application forms may be obtained from the office of the college, 185, Macquarie Street, Sydney, and should be lodged with the honorary secretary at this address not later than July 22.

Obituary.

JOHN BINNY HAY.

We regret to announce the death of Dr. John Binny Hay, which occurred on May 25, 1939, at Mont Albert, Victoria.

Books Received.

THE PHYSIOLOGY OF EXERCISE: A TEXT-BOOK FOR STUDENTS OF PHYSICAL EDUCATION, by J. H. McCurdy, A.M., M.D., M.P.E., and L. A. Larson, B.A., B.P.E., M.Ed., Ph.D.; Third Edition, thoroughly revised; 1939. Philadelphia: Lea and Febiger. Medium 8vo, pp. 349, with illustrations. Price: $3.75 net.

THE MEDICAL ANNUAL: A YEAR BOOK OF TREATMENT AND PRACTITIONER'S INDEX, edited by H. L. Tidy and A. R. Short. 1939. Bristol: John Wright and Sons Limited. Demy 8vo, pp. 660, with illustrations. Price: 20s. net.

Nominations and Elections.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Nott, Lorimer William, M.B., B.S., 1936 (Univ. Melbourne), Winchelsea.

Kiel, Robert, M.D. (Milan), Manangatang.

Diary for the Month.

JUNE 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 7.—Victorian Branch, B.M.A.: Branch.
JUNE 7.—Western Australian Branch, B.M.A.: Council.
JUNE 9.—Queensland Branch, B.M.A.: Council.
JUNE 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 20.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 21.—Western Australian Branch, B.M.A.: Branch.
JUNE 22.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 26.—Queensland Branch, B.M.A.: Council.
JUNE 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 28.—South Australian Branch, B.M.A.: Annual meeting.
JULY 6.—South Australian Branch, B.M.A.: Council.
JULY 27.—South Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xx to xxii.

BRISBANE AND SOUTH COAST HOSPITALS BOARD, QUEENSLAND: Registrar.

CHILDREN'S HOSPITAL, CARLTON, VICTORIA: Honorary Clinical Assistants.

CHILLAGOE HOSPITAL, CHILLAGOE, QUEENSLAND: Medical Officer.

DEVON PUBLIC HOSPITAL, LATROBE, TASMANIA: Surgeon Superintendent.

DEPARTMENT OF MENTAL HYGIENE, MELBOURNE, VICTORIA: Medical Officer.

THE ANTI-TUBERCULOSIS ASSOCIATION OF NEW SOUTH WALES: Registrar.

TARA DISTRICT HOSPITAL, TARA, QUEENSLAND: Medical Officer.

THE UNIVERSITY OF SYDNEY, NEW SOUTH WALES: Post-Graduate Lecturer in Pathology.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officers.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

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